Summary Report

# PENNSYLVANIA TURNPIKE VALUE PRICING STUDY

Contract No. 02-042-RSKR

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

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Prepared for the

PENNSYLVANIA TURNPIKE COMMISSION

By

ENGINEERS
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March 2004

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March 8, 2004

Mr. Robert J. Smith
Finance Director
Pennsylvania Turnpike Commission
P.O. Box 67676
Harrisburg, PA 17106-7676

**Re: Transmittal of Pennsylvania Turnpike Value Pricing Study**

Dear Mr. Smith:

We are pleased to submit this final report document summarizing the various value pricing analyses WSA has conducted during the course of this study. This package includes a comprehensive Summary Report document, as well as supporting documentation provided in three separate Appendices reports.

Your help and guidance, along with that of your staff, was critical in the successful completion of this detailed study. It should also be pointed out that input from both Penn DOT, especially Mr. Daryl Kerns, and from FHWA, especially Ms. Angela Jacobs and Mr. Kiran Bhatt, were most useful in the periodic review sessions we had during the course of this study. Of course, Mr. George Hannon also played a key role in helping to review and refine the various value pricing scenarios to evaluate.

We cannot emphasize the highly dedicated support we received from our two subconsultants, Resource Systems Group and Frank Wilson Associates. They were instrumental in the successful completion of this work by conducting the stated preference surveys, focus groups, stakeholder interviews, and development of the various public relations related material included as part of this study.

I hope this information proves helpful as you move ahead with your planning process. We look forward to working with you on this, and other issues related to Turnpike traffic and revenue, in the future.

Very truly yours,
WILBUR SMITH ASSOCIATES

Gary T. Quinlin
Senior Associate

# EXECUTIVE SUMMARY

In an effort to deal with increasing congestion levels on the Pennsylvania Turnpike mainline sections and toll plazas, the Pennsylvania Turnpike Commission (PTC) is considering the possible implementation of some form of value pricing on its facilities. This study builds upon preliminary analyses of value pricing conducted by Wilbur Smith Associates (WSA) as part of previous studies. The primary emphasis of this study was on the urban interchanges in the Philadelphia and Pittsburgh urban areas, as identified in Figure ES-1. This study will consider possible future toll pricing strategies which may have the potential to:

- Provide an economic incentive to shift traffic out of peak travel periods;
- Provide an economic marketing incentive to encourage use of electronic toll collection;
- Promote the safe and efficient movement of traffic on the Turnpike; and
- Enhance traffic and revenue growth on the Turnpike to help meet forecasted revenue needs.

## DATA COLLECTION EFFORTS

A significant amount of data was collected during the course of this study to aid in estimating the potential impacts of value pricing, as well as to assess Turnpike patrons' and stakeholders' opinions on the subject. Data collection tasks included the following:

1. **Patron Focus Groups**: Two focus groups were held in the Pittsburgh area and two focus groups were held in the Philadelphia area. Each one consisted of 8-12 participants who typically use the Turnpike during weekday peak time periods. The general purpose was to take initial measures of motorists' knowledge of, and attitudes toward, value pricing and its possible implementation on the Turnpike.

   Most participants initially expressed dislike for the idea of differential toll rates based on time of travel. Commuters feel that they have limited flexibility, and are already exercising their flexibility to the maximum extent possible. Non-commuters expressed having more flexibility, and would be more likely to shift travel time to avoid peak period tolls.

Although responses between cities were largely similar, there were noteworthy differences. Philadelphia travelers repeatedly indicated that avoiding congestion is more likely to prompt changes in travel times and routes than avoiding an increased toll, whereas Pittsburgh travelers repeatedly indicated displeasure with toll increase scenarios. Philadelphia participants overall seemed to have less flexibility to commute during off peak times than Pittsburgh participants. Finally, Pittsburgh had at least twice as many participants than Philadelphia who are reimbursed by employers for turnpike trips.

**2.** **Benefit Testing**: At the conclusion of each focus group, all participants were presented with 18 value pricing benefit messages. The goal was to investigate which value pricing concepts resonated the strongest with Turnpike patrons, and which could potentially be used in future marketing campaigns. The top three messages tested were:

a. E-ZPass saves me time at toll plazas. Now, with value pricing, I can save money too;
b. Using the Turnpike is less stressful than traveling on other, more congested highways; and
c. Value pricing is an idea whose time has come. It makes sense to use financial incentives to manage traffic congestion.

**3.** **Stakeholder Interviews**: Stakeholders were all persons whose opinions are valued by the PTC, including representatives from PennDOT, PTC Executive Staff, PTC Commissioners, Transportation Management Association (TMA) Executive Directors, and City Management Officials. In all 21 officials were interviewed as to their opinions regarding various value pricing concepts.

Of the 21 interviews, 9 indicated support for the concept, 5 opposed value pricing, and 7 remained neutral or not sure. Those on the inside of the planning and study of the value pricing project have fears and concerns about implementing a project that, in their view, has the potential to decrease revenue and make patrons angry. In contrast, support among stakeholders for the value pricing project increased in direct proportion to their distance from the project. The people most removed from the project's details were also the most supportive. Support dropped as the level of knowledge about the project increased. Insiders are skeptical about the chances of success pointing to the critical need for case studies

of successful value pricing projects and a good, concise explanation and rationale for the value pricing proposal that is finally developed. Supporters and opponents of value pricing reflect two differing worldviews. However, the large number of stakeholders who are still unsure as to the merits of value pricing could dramatically sway overall opinion.

4. **Stated Preference Surveys**: The core element of the analytical part of the value pricing study was obtained through data collected from the stated preference surveys. Detailed computer based surveys were administered to passenger car motorists who use the Turnpike within the designated value pricing areas. In all, nearly 1,800 passenger car surveys were conducted. In addition, 25 trucking companies were identified which use the Turnpike on a regular basis. Companies represented included those with less than 200 trucks in their fleet, to those with over 1,000.

   In addition to gathering basic information such as trip origin and destination, trip frequency, and trip purpose, the stated preference surveys provided each participant with a series of trade-off "games". Motorists traveling in the peak periods were provided with various combinations, and levels, of peak period surcharges and off-peak discounts. Some of these applied to E-ZPass customers only, and others to cash users as well. An additional variable in each "game" was the amount of time a motorist was willing to shift in order to avoid the peak period surcharge.

   In general, the surveys found that motorists who currently pay cash would be much more likely to join E-ZPass for a toll discount, than to switch their travel times for a toll discount (or to avoid a peak period surcharge). Relatively large toll differentials would be required to alter motorists travel times. These findings largely agree with those found in the focus groups where motorists indicated they were already traveling at times to avoid as much congestion as possible.

   Trucking company responses were somewhat more favorable to the concept of value pricing. Between 15 and 35 percent of those interviewed reported that they would shift the schedule of trucks in their fleet in order to take advantage of off-peak discounts or to avoid peak period surcharges.

5. **Traffic Data Collection:** Updated measures of Turnpike traffic levels, toll plaza operating conditions and travel speeds were

collected as part of this study. Continuous two day traffic counts were taken at all entering and exiting plaza locations in the study area, as well as at selected mainline locations. In order to assess the potential impact of alternative value pricing scenarios on toll plaza operations, it was necessary to collect updated queuing data, by lane and direction (entry versus exit) at each toll plaza.

## VALUE PRICING OPTIONS TESTED

Monthly meetings were held with the value pricing team (PTC, PennDOT and FHWA staff). Key discussions early in the process were centered on how to define the value pricing scenarios to test. Seven variables were identified which formed the basis of all alternatives studied. They included:

1. Peak Period Hours of Application: Two versus Three;
2. Area of Application: Urban versus Full Turnpike;
3. Discount Method: Fixed versus Variable;
4. Method of Time Delineation: Time of Entry or Exit;
5. Days of Application: Weekdays versus All Days;
6. Vehicle Applicability: Passenger Cars versus Trucks; and
7. Amount of Toll Differential Between Peak and Off-Peak and between Cash and E-ZPass.

A preliminary "Long List" of value pricing scenarios was developed for initial study by WSA. Several of these were eliminated after review by the value pricing team, either because they were technically infeasible, or had characteristics very similar to other scenarios.

Ultimately a "Short List" of value pricing scenarios was developed for more in depth analysis. Table ES-1 identifies the characteristics associated with the short list of value pricing alternatives. Originally, four to five different rate differential alternatives were tested for each scenario, but this was reduced to the two rate differential options shown in Table ES-2 for each value pricing alternative.

A total of 11 scenarios are identified in Table ES-1. Scenarios 18 and 19 were really independent analysis regarding special tolling conditions for trucks and for motorcycles. Details of these can be found in Chapter 7 of the Summary Report.

Scenarios 1, 3, 6, and 9 all provide for some form of time of day pricing. That is to say, there is a toll differential between peak and off-peak periods

to provide an incentive to shift travel time. Scenarios 15 and 20 do not provide a toll differential between peak and off-peak periods, but rather only a discount between cash and E-ZPass motorists. In these two cases, the toll differential only provides an incentive to shift from cash to E-ZPass.

Scenarios 17-1 and 17-2 are identical to Scenarios 1 and 2 during the weekday, but provide the additional E-ZPass only discounts (similar to Scenarios 15 and 20) at the urban area interchanges on weekend days, and for the interurban interchanges on all days. Value Pricing Scenario 14 is not really a scenario to test, but rather the "placeholder" for the final preferred alternative. A detailed description of the development of the "Short List" and of the characteristics of each value pricing scenario can be found in Chapter 4 and the first section of Chapter 6.

## VALUE PRICING MEASUREMENT CRITERIA

A logit model was developed from the results of the stated preference survey to estimate motorists' reactions to the selected value pricing scenarios and toll rate differentials. The logit model determines the likelihood of time shift and shift from cash to E-ZPass, but it does not estimate the potential diversionary impacts of higher toll rates. WSA's regional diversion model was used to estimate the diversion of traffic to alternative routes for those not willing to shift time of travel.

Detailed time shift and diversion impacts on traffic are shown in Appendix Tables 1-96 for each scenario tested. These provide information by interchange, time period and toll rate. They also show impacts by vehicle class (cars versus trucks) and by payment type (cash versus E-ZPass). A more summarized version of this information is also presented in Tables 5-1 through 5-12. Estimated annual toll revenue impacts are shown in Tables 5-13 through 5-24, and in Tables 6-3 through 6-6. All information is presented at estimated 2002 and 2012 levels.

Tables ES-3 (for 2002) and ES-4 (for 2012) provide a summary of the estimated annual revenue impacts associated with each scenario as well as the AM peak period percent impacts resulting from both time shift and toll diversion. Scenarios 15 and 50, which only provide for a cash to E-ZPass shift (and no time of day shift), exhibit the smallest impacts in terms of both traffic and revenue. All other scenarios provide generally similar peak period traffic impacts at the urban interchanges, with total traffic reductions in the 15-20 percent range. Scenarios 1, 6 and 9 generate significantly less revenue than Scenarios 3, 17-1 and 17-2 because they only apply to the urban interchanges.

In addition to measuring the traffic and revenue impacts of value pricing, several additional analyses were conducted to evaluate the effectiveness of each short listed scenario. Studies were conducted to estimate the resulting peak period Levels of Service (Tables 6-15 through 6-18 and Figures 6-11 through 6-20). In general, significant 2012 mainline operating improvements were estimated for all scenarios, except for Scenarios 15 and 20 (which showed almost no improvement compared to a "do nothing" condition).

Toll plaza operating conditions at 2012 levels were also deemed to improve significantly for all scenarios, except for Scenarios 15 and 20. Report Appendix Figures 35 through 42 show the estimated reduction in both average and total toll plaza delay compared to the "do nothing" scenario.

A final analysis was conducted to ensure that the diversion effect of the rate increases did not adversely affect alternative non-Turnpike roads. Tables 6-19 through 6-22 (and Figures 6-21 and 6-22) show the estimated distribution of diverted traffic on local roads parallel to the Turnpike. Overall diversion impacts were relatively low, and once distributed among several routes, the impacts on any one individual road were found to be relatively small.

## VALUE PRICING SELECTION CRITERIA MATRIX

The final element of the value pricing study consisted in the development of a value pricing selection criteria matrix. This provides a framework in which to take into account the many elements of the study and quantify them for each scenario. This was a very subjective task, and the matrix was developed over a period of time with significant input from the PTC value pricing team.

Tables ES-5 and ES-6 show the preliminary selection criteria matrices. Each row represents one scenario and toll rate, with each column representing important study variables. Some of these are clearly measurable variables, such as "Revenue Impact", or "Increased E-ZPass Participation". Others, however, are much more subjective, though no less important, such as "Public Acceptance".

Each variable was given a score based on the study results. As shown at the bottom of the tables, the scores ranged from 1-5, with 5 representing the greatest impact. The first row of the table shows the weighting factor

each of these variables was assigned. The weighting factors represent the only difference between Tables ES-5 and ES-6.

Table ES-5 was meant to represent an interim value pricing condition, while Table ES-6 was meant to represent an ultimate value pricing condition. Thus, the weighting factor for increased revenue is relatively low (0.10) on an interim basis, but public acceptance is high (0.20). Ultimately, however, once implemented, the relative weighting changes such that revenue enhancements become more important (0.20 in Table ES-6) and public acceptance becomes less of an issue (0.10 in Table ES-6).

The overall idea is to develop a scoring system upon which to compare all scenarios. Based on the scoring and weighting factors used in Table ES-5, the highest total scores go to Scenarios 3, 15 and 20. It seems the key variables on which these three score high are ease of implementation, public acceptance, and for Scenarios 1 and 15, revenue impacts.

For the ultimate condition (Table ES-6) the three highest scoring scenarios are 3, 17-1 and 17-9. These score high on revenue impact and impact on interchange and mainline operations. Ultimately these are the important variables value pricing is intended to address.

Clearly, however, the results of these two tables can change dramatically with differing assumptions regarding not only the weighting of each variable, but the variables themselves. It is likely that additional discussion and refinement of these will be required in the event that some form of value pricing be considered for implementation on the Pennsylvania Turnpike.

## COMMERCIAL VEHICLE ONLY NIGHT TIME DISCOUNT SCENARIOS

PTC requested that, in addition to the value pricing scenarios discussed above (which included both passenger car and commercial value pricing options) WSA study the concept of a night time only discount value pricing concept that would be applicable to commercial vehicles.

It is helpful to understand a little more about what variables might influence the usefulness of a commercial vehicle only night time discount program. The following responses were gathered as part of the commercial vehicle stated preference survey effort. The first has to do with who makes the route decision:

"Who decides the delivery route?"

The Driver – 35 percent
The Company – 60 percent
Both – 5 percent

This would indicate that the company itself is the single most important variable in the ability to set a policy for taking advantage of the delivery route. The individual driver, however, does play a significant role in 35 percent of the companies when it comes to that decision making power.

The second key question was the following:

"What types of cargo does your company usually transport?"

Freight is time sensitive – 52 percent
Freight is both time and non-time sensitive – 32 percent
Freight is not time sensitive – 16 percent

This would indicate that in over half of the freight shipments, i.e., those that are time sensitive, toll rate incentives to shift travel time would not be effective. Still, that does mean that a significant proportion of companies would be able to shift travel time if the right incentives were provided.

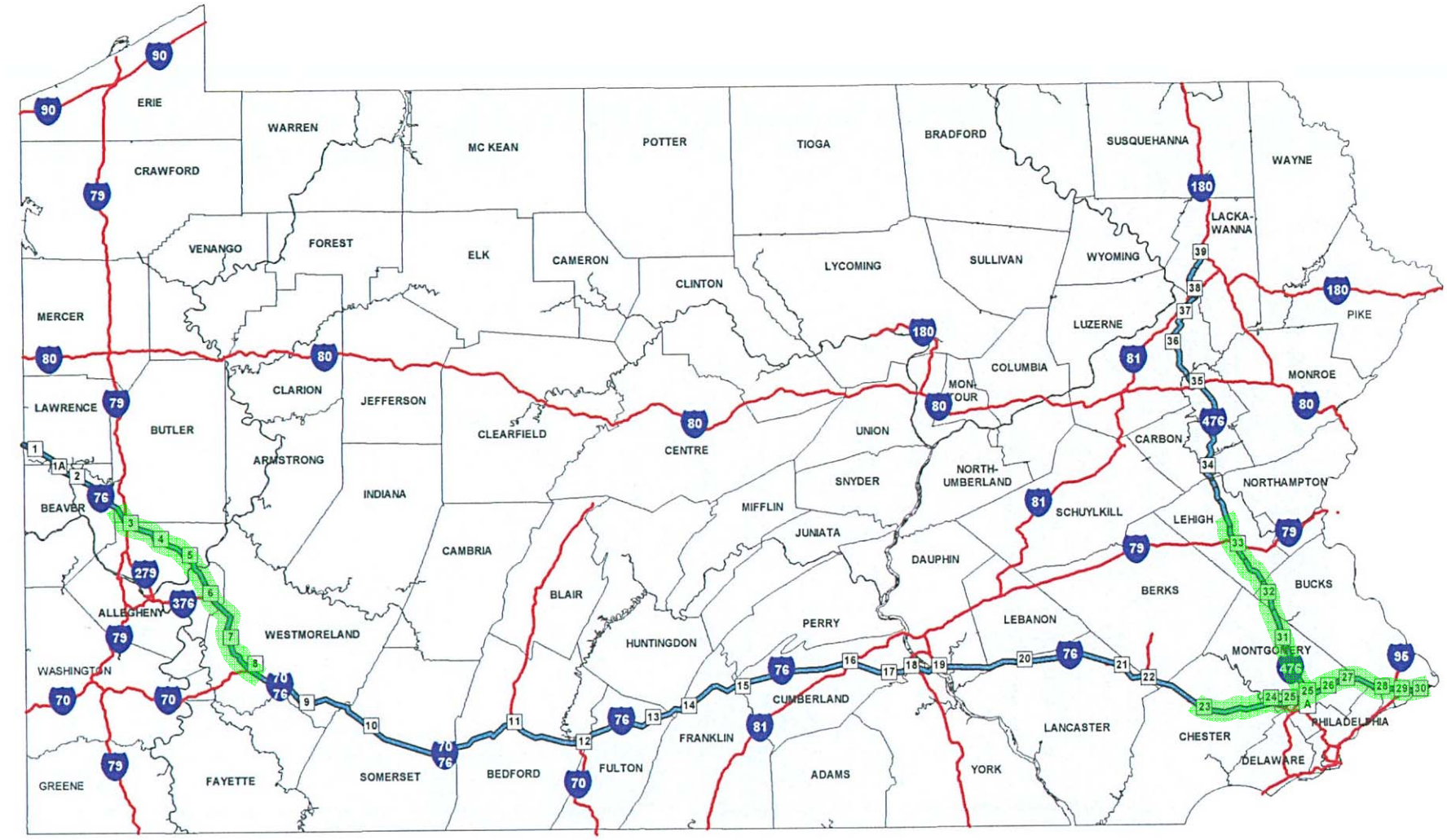
WSA tested night time discounts of 10, 15 and 20 percent for Classes 2-9, and for Classes 4-9. The discount period was also varied to be between 11 PM and 5 AM, 10 PM and 5 AM, and between 9 PM and 5 AM. One final variable was whether the night time discount was applied to weekdays only, or to all days of the week. All discounts were only applied to those in the E-ZPass program; cash patrons were not assumed to receive any discount.

Under all scenarios tested, the net revenue loss to the Turnpike resulting from each of these was minimal. Even under the most liberal discount scenario identified above (a 20 percent discount offered between 9 PM and 5 AM and applicable all days of the week), the estimated net revenue loss only amounts to about 1 percent of total system toll revenue. The lowest percent revenue impacts amount to about a 0.3 percent loss of net toll revenue.

The net impact on commercial traffic volumes in the identified night time periods ranged from an increase of about 0.2 percent to about 0.7 percent as a result of the night time discount. It was estimated that all of the increase would occur from the shoulder hours that immediately precede

and succeed discount period. In other words, if the discount period extended from 11 PM to 5 AM, the shift into the night time period would only occur from those traveling in the hours just preceding 11 PM, and the hours just after 5 AM. The ability to shift beyond these times was found to be very minimal.

# Summary Report - Pennsylvania Turnpike Value Pricing Study

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## STUDY AREA LOCATION MAP

FIGURE ES-1

**Table ES-1**

## Revised Value Pricing Scenario "Short List"

**Pennsylvania Turnpike Value Pricing Study**

| Scenario | Hours of Application | Area of Application | Discount Method | Time Delineation | Days of Application | Vehicle Applic. (1) | Typical Rate Differentials (2) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Cash | | | E-Zpass | | |
| | | | | | | | Peak | Off-Peak | Night | Peak | Off-Peak | Night |
| 1 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | + | + | + | 0 | 0 |
| 3 | 2 per peak | Full Turnpike | Fixed Increment | Exit | Weekdays | All | + | + | + | + | 0 | 0 |
| 6 | 2 per peak | Urban Areas | Fixed Increment | Entry or Exit | Weekdays | All | + | + | + | + | 0 | 0 |
| 9 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | + | + | - | 0 | 0 |
| 15 | All | Full Turnpike | Fixed Increment | None | All | All | + | + | + | 0 | 0 | 0 |
| 17-1 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | + | + | + | 0 | 0 |
| | All | Urban Areas | Fixed Increment | None | Weekend Days | All | + | + | + | 0 | 0 | 0 |
| | All | Interurban Areas | Fixed Increment | None | All | All | + | + | + | 0 | 0 | 0 |
| 17-9 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | + | + | - | 0 | 0 |
| | All | Urban Areas | Fixed Increment | None | Weekend Days | All | + | + | + | 0 | 0 | 0 |
| | All | Interurban Areas | Fixed Increment | None | All | All | + | + | + | 0 | 0 | 0 |
| 20 | All | Full Turnpike | Percent Increment | None | All | All | + | + | + | 0 | 0 | 0 |
| 14 | Preferred | Preferred | Preferred | Preferred | Preferred | Preferred | - - - - - Preferrred - - - - - | | | - - - - - Preferrred - - - - - | | |
| 18 | All | Harrisburg-Downingtown | Percent | Preferred | Weekdays | Truck | 0 | 0 | 0 | - | - | - |
| 19 | Provide additional motorcycle discount on final preferred scenario (E-Zpass discount only, no change to cash toll rates). | | | | | | | | | | | |

(1) When "All" is indicated, impacts will be estimated for cars and trucks separately.

(2) A "+" indicates a rate higher than the current toll, a "-" indicates a rate lower than the "+" toll, and a "0" indicates no change from the current toll. At no time are rates to be tested which are lower than current toll rates. Thus, it should be recognized that a toll with a "-" sign, while lower than a toll with a "+" sign, is still greater than rates where no toll change is assumed (a "0" sign).

**Table ES-2**

## Revised Toll Rate Differentials
## Tested for Each Value Pricing Scenario

Pennsylvania Turnpike Value Pricing Study

DRAFT

| Applicable Scenario | | Rate | Cash Rates | | E-Zpass Rates | |
|---|---|---|---|---|---|---|
| | | | Peak | Off-Peak | Peak | Off-Peak |
| 1, 3, 6 | | 1 | $0.75 | $0.75 | $0.75 | $0.00 |
| | | 3 | 1.00 | 1.00 | 1.00 | 0.00 |
| 9 | | 1 | $0.75 | $0.75 | $0.50 | $0.00 |
| | | 2 | 1.00 | 1.00 | 0.75 | 0.00 |
| 15 | | 1 | $0.75 | $0.75 | $0.00 | $0.00 |
| | | 2 | 1.00 | 1.00 | 0.00 | 0.00 |
| 17-1 | Urban Weekday | 1 | $0.75 | $0.75 | $0.75 | $0.00 |
| | Urban Weekend | | 0.75 | 0.75 | 0.00 | 0.00 |
| | Interurban | | 0.75 | 0.75 | 0.00 | 0.00 |
| | Urban Weekday | 3 | $1.00 | $1.00 | $1.00 | $0.00 |
| | Urban Weekend | | 1.00 | 1.00 | 0.00 | 0.00 |
| | Interurban | | 1.00 | 1.00 | 0.00 | 0.00 |
| 17-9 | Urban Weekday | 1 | $0.75 | $0.75 | $0.50 | $0.00 |
| | Urban Weekend | | 0.75 | 0.75 | 0.00 | 0.00 |
| | Interurban | | 0.75 | 0.75 | 0.00 | 0.00 |
| | Urban Weekday | 2 | $1.00 | $1.00 | $0.75 | $0.00 |
| | Urban Weekend | | 1.00 | 1.00 | 0.00 | 0.00 |
| | Interurban | | 1.00 | 1.00 | 0.00 | 0.00 |
| 20 | | 2 | + 10% | + 10% | 0 % | 0 % |
| | | 3 | + 20% | + 20% | 0 % | 0 % |

**Table ES-3**
**Overall Comparative Summary**
**of Estimated Value Pricing Results at 2002 Levels**

Pennsylvania Turnpike Value Pricing Study

| Value Pricing Scenario | VP Toll Scenario | Estimated Annual Revenue Impact (1,000s) | Annual Percent Revenue Impact | Passenger Car Urban Interchange Percent AM Peak Traffic Impacts | | | Percent Car AM Peak E-ZPass Share (1) |
|---|---|---|---|---|---|---|---|
| | | | | Diverted | Shifted | Total | |
| Base | | $0 | - - | - - | - - | - - | 42.9 |
| 1 | 1 | 37,364 | 10.0 | (9.4) | (7.0) | (16.4) | 41.7 |
| | 3 | 46,204 | 12.3 | (12.3) | (9.5) | (21.8) | 41.2 |
| 3 | 1 | 62,717 | 16.7 | (9.4) | (7.0) | (16.4) | 41.7 |
| | 3 | 77,416 | 20.7 | (12.3) | (9.5) | (21.8) | 41.2 |
| 6 | 1 | 45,441 | 12.1 | (8.8) | (6.9) | (15.7) | 40.3 |
| | 3 | 56,425 | 15.1 | (11.4) | (9.3) | (20.7) | 39.8 |
| 9 | 1 | 35,424 | 9.5 | (8.1) | (6.2) | (14.3) | 44.8 |
| | 2 | 44,421 | 11.9 | (11.0) | (9.2) | (20.2) | 44.1 |
| 15 | 1 | 67,255 | 18.0 | (5.0) | 0.0 | (5.0) | 53.4 |
| | 2 | 82,248 | 22.0 | (6.4) | 0.0 | (6.4) | 56.9 |
| 17-1 | 1 | 74,696 | 19.9 | (9.4) | (7.0) | (16.4) | 41.7 |
| | 3 | 91,657 | 24.5 | (12.3) | (9.5) | (21.8) | 41.2 |
| 17-9 | 1 | 72,757 | 19.4 | (8.1) | (6.2) | (14.3) | 44.8 |
| | 2 | 89,873 | 24.0 | (11.0) | (9.2) | (20.2) | 44.1 |
| 20 | 2 | 17,599 | 4.7 | (0.7) | 0.0 | (0.7) | 44.4 |
| | 3 | 33,326 | 8.9 | (1.3) | 0.0 | (1.3) | 45.8 |

(1) The percent E-ZPass share shown is only for the average weekday condition at the urban interchanges.

**Table ES-4**
**Overall Comparative Summary**
**of Estimated Value Pricing Results at 2012 Levels**

Pennsylvania Turnpike Value Pricing Study

| Value Pricing Scenario | VP Toll Scenario | Estimated Annual Revenue Impact (1,000s) | Annual Percent Revenue Impact | Passenger Car Urban Interchange Percent AM Peak Traffic Impacts | | | Percent Car AM Peak E-ZPass Share (1) |
|---|---|---|---|---|---|---|---|
| | | | | Diverted | Shifted | Total | |
| Base | | $0 | - - | - - | - - | - - | 54.6 |
| 1 | 1 | 51,245 | 10.1 | (6.9) | (7.5) | (14.4) | 53.3 |
| | 3 | 63,462 | 12.5 | (9.5) | (10.2) | (19.7) | 52.8 |
| 3 | 1 | 87,482 | 17.2 | (6.9) | (7.5) | (14.4) | 53.3 |
| | 3 | 108,182 | 21.2 | (9.5) | (10.2) | (19.7) | 52.8 |
| 6 | 1 | 62,594 | 12.3 | (6.5) | (7.4) | (13.9) | 51.6 |
| | 3 | 77,697 | 15.2 | (8.9) | (10.0) | (18.9) | 51.1 |
| 9 | 1 | 47,754 | 9.4 | (5.5) | (6.2) | (11.7) | 56.1 |
| | 2 | 60,399 | 11.9 | (8.1) | (9.2) | (17.3) | 55.5 |
| 15 | 1 | 89,144 | 17.5 | (3.0) | 0.0 | (3.0) | 62.6 |
| | 2 | 109,362 | 21.5 | (4.0) | 0.0 | (4.0) | 65.3 |
| 17-1 | 1 | 102,172 | 20.1 | (6.9) | (7.5) | (14.4) | 53.3 |
| | 3 | 125,652 | 24.7 | (9.5) | (10.2) | (19.7) | 52.8 |
| 17-9 | 1 | 98,680 | 19.4 | (5.5) | (6.2) | (11.7) | 56.1 |
| | 2 | 122,589 | 24.1 | (8.1) | (9.2) | (17.3) | 55.5 |
| 20 | 2 | 24,459 | 4.8 | (0.2) | 0.0 | (0.2) | 55.5 |
| | 3 | 44,841 | 8.8 | (0.6) | 0.0 | (0.6) | 56.7 |

(1) The percent E-ZPass share shown is only for the average weekday condition at the urban interchanges.

**Table ES-5**

## Potential Value Pricing Scenario Selection Criteria

Pennsylvania Turnpike

Interim Value Pricing Implementation Criteria Weighting

| VP Scenario | VP Toll Revenue Impact | Implementation Costs | Impact on Mainline Operations | Impact on Interchange Operations | Increased E-ZPass Participation | Ease of Implementation | Public Acceptance | Impact on Alternative Routes | Average Weighted Factor |
|---|---|---|---|---|---|---|---|---|---|
| Weighting Factor | 0.10 | 0.15 | 0.05 | 0.10 | 0.10 | 0.20 | 0.20 | 0.10 | 1.00 |
| Scenario 1 | | | | | | | | | |
| Rate 1 | 2.0 | 2.5 | 4.0 | 3.5 | 3.0 | 3.0 | 3.5 | 3.0 | 3.03 |
| Rate 3 | 3.0 | 2.5 | 5.0 | 5.0 | 4.0 | 3.0 | 3.0 | 2.5 | 3.28 |
| Scenario 3 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 4.0 | 3.5 | 3.0 | 3.5 | 2.5 | 3.0 | 3.13 |
| Rate 3 | 5.0 | 2.5 | 5.0 | 5.0 | 4.0 | 3.5 | 2.0 | 2.5 | 3.38 |
| Scenario 6 | | | | | | | | | |
| Rate 1 | 3.0 | 2.5 | 4.0 | 3.5 | 3.0 | 2.0 | 3.0 | 3.5 | 2.88 |
| Rate 3 | 4.0 | 2.5 | 5.0 | 5.0 | 4.0 | 2.0 | 2.5 | 2.5 | 3.08 |
| Scenario 9 | | | | | | | | | |
| Rate 1 | 2.0 | 2.5 | 3.5 | 3.5 | 3.0 | 2.5 | 4.0 | 3.5 | 3.05 |
| Rate 2 | 3.0 | 2.5 | 4.5 | 5.0 | 4.0 | 2.5 | 3.5 | 3.0 | 3.30 |
| Scenario 15 | | | | | | | | | |
| Rate 1 | 4.0 | 4.5 | 2.0 | 2.5 | 3.5 | 4.0 | 3.5 | 4.0 | 3.68 |
| Rate 2 | 5.0 | 4.5 | 2.0 | 3.5 | 4.5 | 4.0 | 3.0 | 3.5 | 3.83 |
| Scenario 17-1 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 4.0 | 3.5 | 3.5 | 2.0 | 3.0 | 3.0 | 2.98 |
| Rate 3 | 5.0 | 2.5 | 5.0 | 5.0 | 4.5 | 2.0 | 2.5 | 2.5 | 3.23 |
| Scenario 17-9 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 3.5 | 3.5 | 3.5 | 2.0 | 3.5 | 3.5 | 3.10 |
| Rate 2 | 5.0 | 2.5 | 4.5 | 5.0 | 4.5 | 2.0 | 3.0 | 3.0 | 3.35 |
| Scenario 20 | | | | | | | | | |
| Rate 2 | 1.0 | 4.5 | 1.0 | 2.0 | 1.5 | 5.0 | 5.0 | 5.0 | 3.68 |
| Rate 3 | 2.0 | 4.5 | 1.5 | 3.0 | 2.0 | 5.0 | 4.5 | 4.5 | 3.80 |
| | 1 - 0-5%<br>2 - 5-10<br>3 - 10-15<br>4 - 15-20<br>5 - 20-25 | 1 - Most<br>5 - Least | 1 - Worst<br>5 - Best | 1 - Worst<br>5 - Best | 1 - Lowest<br>5 - Highest | 1 - Hardest<br>5 - Easiest | 1 - Least<br>5 - Most | 1 - Most<br>5 - Least | 1 - Lowest<br>5 - Highest |

**Table ES-6**

## Potential Value Pricing Scenario Selection Criteria

Pennsylvania Turnpike

Ultimate Revenue and Operational Improvement Criteria Weighting

| VP Scenario | VP Toll Revenue Impact | Implementation Costs | Impact on Mainline Operations | Impact on Interchange Operations | Increased E-ZPass Participation | Ease of Implementation | Public Acceptance | Impact on Alternative Routes | Average Weighted Factor |
|---|---|---|---|---|---|---|---|---|---|
| Weighting Factor | 0.20 | 0.03 | 0.20 | 0.20 | 0.15 | 0.02 | 0.10 | 0.10 | 1.00 |
| Scenario 1 | | | | | | | | | |
| Rate 1 | 2.0 | 2.5 | 4.0 | 3.5 | 3.0 | 3.0 | 3.5 | 3.0 | 3.14 |
| Rate 3 | 3.0 | 2.5 | 5.0 | 5.0 | 4.0 | 3.0 | 3.0 | 2.5 | 3.89 |
| Scenario 3 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 4.0 | 3.5 | 3.0 | 3.5 | 2.5 | 3.0 | 3.45 |
| Rate 3 | 5.0 | 2.5 | 5.0 | 5.0 | 4.0 | 3.5 | 2.0 | 2.5 | 4.20 |
| Scenario 6 | | | | | | | | | |
| Rate 1 | 3.0 | 2.5 | 4.0 | 3.5 | 3.0 | 2.0 | 3.0 | 3.5 | 3.32 |
| Rate 3 | 4.0 | 2.5 | 5.0 | 5.0 | 4.0 | 2.0 | 2.5 | 2.5 | 4.02 |
| Scenario 9 | | | | | | | | | |
| Rate 1 | 2.0 | 2.5 | 3.5 | 3.5 | 3.0 | 2.5 | 4.0 | 3.5 | 3.13 |
| Rate 2 | 3.0 | 2.5 | 4.5 | 5.0 | 4.0 | 2.5 | 3.5 | 3.0 | 3.88 |
| Scenario 15 | | | | | | | | | |
| Rate 1 | 4.0 | 4.5 | 2.0 | 2.5 | 3.5 | 4.0 | 3.5 | 4.0 | 3.19 |
| Rate 2 | 5.0 | 4.5 | 2.0 | 3.5 | 4.5 | 4.0 | 3.0 | 3.5 | 3.64 |
| Scenario 17-1 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 4.0 | 3.5 | 3.5 | 2.0 | 3.0 | 3.0 | 3.54 |
| Rate 3 | 5.0 | 2.5 | 5.0 | 5.0 | 4.5 | 2.0 | 2.5 | 2.5 | 4.29 |
| Scenario 17-9 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 3.5 | 3.5 | 3.5 | 2.0 | 3.5 | 3.5 | 3.54 |
| Rate 2 | 5.0 | 2.5 | 4.5 | 5.0 | 4.5 | 2.0 | 3.0 | 3.0 | 4.29 |
| Scenario 20 | | | | | | | | | |
| Rate 2 | 1.0 | 4.5 | 1.0 | 2.0 | 1.5 | 5.0 | 5.0 | 5.0 | 2.26 |
| Rate 3 | 2.0 | 4.5 | 1.5 | 3.0 | 2.0 | 5.0 | 4.5 | 4.5 | 2.74 |
| | 1 - 0-5%<br>2 - 5-10<br>3 - 10-15<br>4 - 15-20<br>5 - 20-25 | 1 - Most<br>5 - Least | 1 - Worst<br>5 - Best | 1 - Worst<br>5 - Best | 1 - Lowest<br>5 - Highest | 1 - Hardest<br>5 - Easiest | 1 - Least<br>5 - Most | 1 - Most<br>5 - Least | 1 - Lowest<br>5 - Highest |

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# CHAPTER 1
# INTRODUCTION

In an effort to deal with increasing congestion levels on the Pennsylvania Turnpike mainline sections and toll plazas, the Pennsylvania Turnpike Commission (PTC) is considering the possible implementation of some form of value pricing on its facilities. This study builds upon preliminary analyses of value pricing conducted by Wilbur Smith Associates (WSA) as part of previous studies. This study will consider possible future toll pricing strategies which may have the potential to:

- Provide an economic incentive to shift traffic out of peak travel periods;
- Provide an economic marketing incentive to encourage use of electronic toll collection;
- Promote the safe and efficient movement of traffic on the Turnpike; and
- Enhance traffic and revenue growth on the Turnpike to help meet forecasted revenue needs.

As will be discussed in detail, a significant amount of data collection was undertaken in support of this study. Updated traffic counts were conducted at Turnpike mainline and ramp locations, and plaza level delay and queuing data were also collected. Stated preference surveys, focus groups, and stakeholder interviews were conducted in both primary urban areas (Philadelphia and Pittsburgh) of the study corridor. Preliminary marketing and public relations material were also developed for possible use in introducing the concept of "Value Pricing" to the public.

## STUDY OVERVIEW

This study began in early 2002, and consisted of a highly interactive process between WSA and the value pricing team, which consisted of PTC, Penn DOT, and FHWA staff. Monthly meetings were held to develop preliminary value pricing concepts to consider for evaluation, and to review and refine those concepts over the course of the study.

A "long list" of over a dozen value pricing concepts was initially developed for screening. Over the course of the study this was narrowed to a "short list" of about a half dozen value pricing concepts, for which detailed analyses were conducted. All analyses were conducted at estimated 2002 and 2012 levels.

The focus of the study was generally on the Turnpike's urban ticket system interchanges. Figure 1-1 shows the Turnpike system with the primary areas of study highlighted. As shown, the Pittsburgh study area consisted of Interchanges 3-8, while the Philadelphia study area included Interchanges 23-30 and 25A-33 (on the Northeast Extension). It should be noted, however, that several of the value pricing scenarios developed for this study did consider value pricing on the interurban portions of the Turnpike.

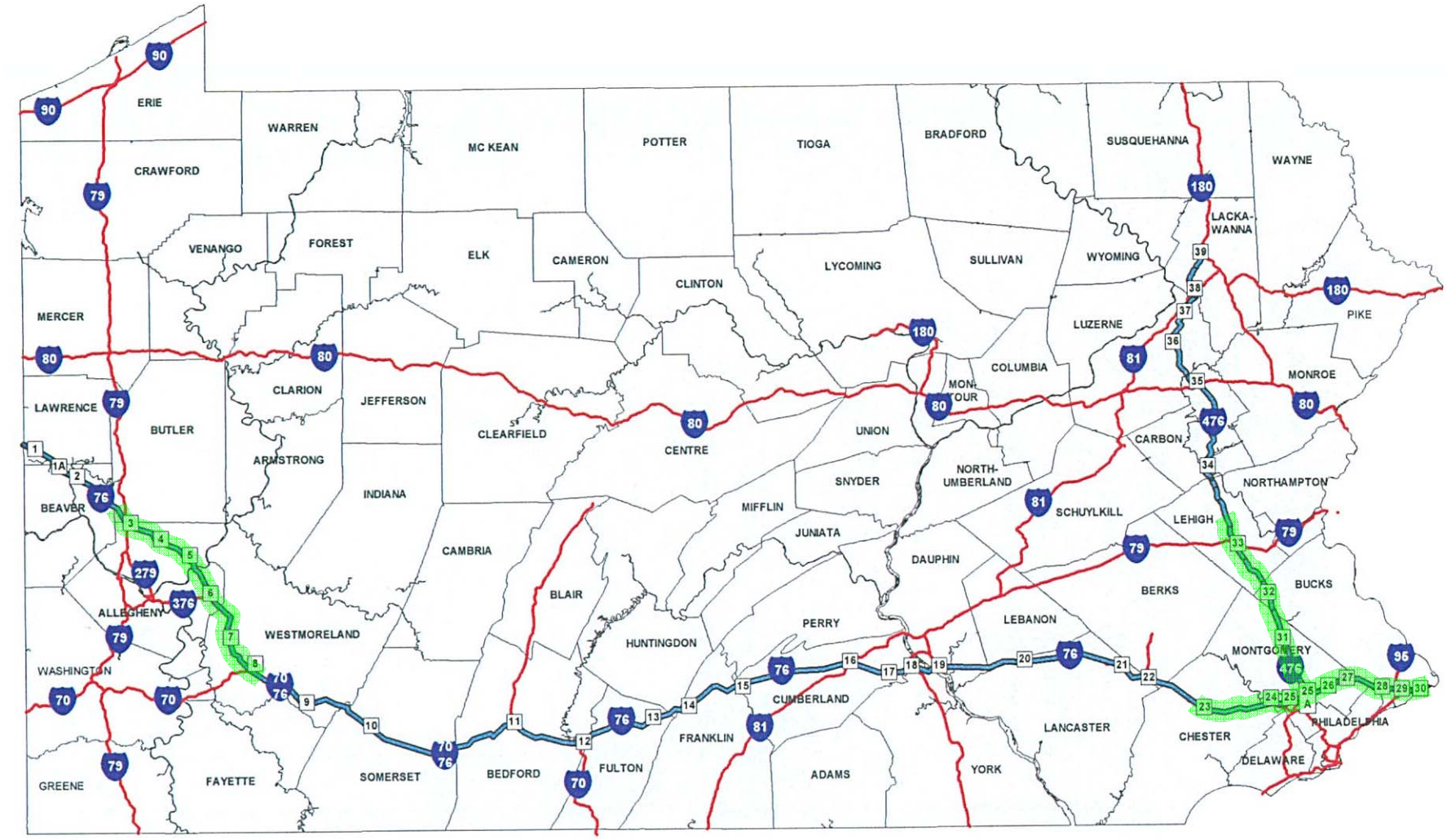
The urban study areas were largely defined as the focus of this analysis because they exhibit the greatest traffic volumes on the system. Peak period traffic congestion, on both the mainline and interchanges, are often at, or near, capacity. In addition to reducing overall levels of service and causing dangerous driving conditions, such severe congestion restricts the ability of the Turnpike system to grow (in both traffic and revenue). Value pricing is an efficient means to offer motorists an incentive to shift their travel from the congested peak periods to the less congested off-peak periods.

The overall goal of value pricing is to shift sufficient numbers of motorists to off-peak periods so that expensive and disruptive major roadway, interchange, and toll plaza expansion projects can be pushed further into future. To that end, in addition to simply estimating the revenue impacts of each value pricing scenario, WSA also developed detailed interchange and mainline level of service measures. Another key consideration in analyzing each value pricing scenario was the impact on estimated peak and off-peak E-ZPass usage.

A secondary effect of many of the value pricing options studied was to divert traffic, not to off-peak periods, but to alternative non-Turnpike roads. Even small shifts of traffic from the Turnpike to alternative local roads could be devastating. Thus, for each of the "short list" of value pricing options analyzed, WSA conducted a detailed impact analysis on alternative parallel routes to the Turnpike.

Ultimately, a series of criteria were developed by which to compare each of the short listed value pricing scenarios. Considerations such as their impact on toll revenue, mainline levels of service, toll plaza operations,

# Summary Report - Pennsylvania Turnpike Value Pricing Study




ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

## STUDY AREA LOCATION MAP

FIGURE 1-1

off-Turnpike diversion, and ease of implementation were taken into account. Even some rather more subjective criteria, such as public acceptance, were also taken into consideration. A selection criteria matrix was developed which gave each of these measurement categories a weighted value. The sum total of each value results in a value pricing "score" and allows for a comparison between scenarios.

Finally, two somewhat independent, but related, analyses were also conducted as part of this study. They were included in order to address specific concerns raised by Turnpike users. The first involves an evaluation of the potential to shift existing truck traffic from PA Route 41 in Chester County to the Pennsylvania Turnpike. The second involves the application of an across the board discount for motorcycles using E-ZPass.

It should be noted that, as of the time of this report, no definitive action has been taken by PTC regarding value pricing (though a motorcycle E-ZPass discount was implemented). It should also be noted that value pricing is easiest to implement when it coincides with a general toll rate increase. Value pricing offers many motorists the option of a reduced, or no, toll increase for shifting their travel time, and/or shifting from cash to E-ZPass. As the Turnpike now has a programmed rate increase scheduled for August 2004, this may by an opportune time to consider re-examining the role of value pricing on the Turnpike.

## REPORT STRUCTURE

This report is divided into seven chapters. Chapter 1 is the Introduction. Chapter 2 provides a summary of the stated preference survey and focus group data collection efforts conducted by Resource Systems Group (RSG). RSG has worked for WSA in this capacity on numerous studies in the past.

Chapter 2 also summarizes the work of another subconsultant, Frank Wilson & Associates (FW&A). They conducted various market research efforts during the course of this study, including input to the focus groups and detailed stakeholder interviews. In addition to this chapter, separate, stand alone, appendices were developed by RSG (Appendix A) and FW&A (Appendix B) which provide a much more detailed review of their work.

Chapter 3 provides a summary of the Turnpike operating characteristics data collection effort. This includes numerous traffic counts, toll plaza operations observations, travel time studies, and more. In addition to this

chapter, a detailed, stand alone, document (Appendix C) was developed to provide full details of these work efforts.

Chapter 4 identifies the initial "long list" of value pricing options considered for analysis. The criteria and reasoning behind the development of the "short list" of scenarios is also presented.

Chapter 5 presents a summary of the impact analyses associates with each value pricing scenario considered for the "short list." In all, six value pricing scenarios are analyzed in this chapter. Toll plaza level traffic and revenue impacts are reviewed for each of the six scenarios.

Chapter 6 provides an even more detailed analysis of a revised version of the "short list." Two additional value pricing scenarios were added to the "short list" for consideration. In this chapter, the estimated levels of service are developed for each Turnpike mainline segment. Off-Turnpike impacts due to toll diversion are also presented. The final section of Chapter 6 describes the selection criteria matrix used to compare each of the value pricing scenarios against one another.

And Chapter 7 provides a summary of the two special studies conducted as part of this study. As mentioned above, these include the potential to use Turnpike pricing incentives to shift traffic from PA Route 41 in Chester County to the Turnpike, and the potential impact of offering discounted toll rates to motorcycles using E-Zpass.

# CHAPTER 2
# STATED PREFERENCE SURVEYS, AND MARKET RESEARCH

As part of the Value Pricing Study, WSA authorized Resource Systems Group, Incorporated (RSG) to conduct stated preference surveys, and Frank Wilson & Associates (FW&A) to conduct a market research study. Stated preference surveys were conducted to determine how Turnpike patrons currently use and view the Turnpike, and how their travel patterns and times may change in response to proposed pricing strategies on the Turnpike. RSG's full report on the stated preference surveys is presented in Appendix A, Resource Systems Group Focus Group And Stated Preference Survey Report Documents, dated May 2003.

The market research program was conducted to determine the best ways to "market" or describe the value pricing program to the public. The results of the study can be used to create effective messages that can be incorporated into technical reports, presentations, press materials and marketing. The complete results of the market research program are presented in Appendix B, Frank Wilson & Associates Market Study, Documents For The Pennsylvania Turnpike Commission.

## FOCUS GROUPS AND STATED PREFERENCE SURVEYS

As preliminary input to developing the stated preference surveys, RSG conducted focus groups. The focus groups were held to garner enough information to be able to effectively develop the stated preference surveys. In addition, the market research study was initiated at the focus groups.

### FOCUS GROUPS

Four focus groups made up of approximately 8 to 12 participants were conducted in spring 2002. Two focus groups were held in the Pittsburgh area and two groups were held in the Philadelphia area. Each focus group lasted for about 1.5 to 2.0 hours.

The participants were chosen to represent regular peak-period commuters or other peak-period patrons who use the Pennsylvania Turnpike in the following two areas:

1. The Pittsburgh area - between Interchanges 3/28 (Cranberry) and 8/75 (New Stanton),

2. The Philadelphia area -
    a. Between Interchanges 23/312 (Downingtown) and 30/359 (Delaware River Bridge), and
    b. On the Northeast Extension between Interchanges 25A/20 (Mid-County) and 33/56 (Lehigh Valley).

The focus groups were formed to evaluate the five following basic topics:

1. Information about the current commute trip;
2. Impressions of the Turnpike facilities;
3. Perceived flexibility in travel time and route choice;
4. Impressions of value pricing scenarios and how a trip may be altered in response to a scenario; and
5. Reactions to prepared messages and statements regarding value pricing that were prepared by FW&A as part of the market research component.

Most participants initially expressed dislike for the idea of differential toll rates based on time of travel. Commuters feel that they have limited flexibility, and are already exercising their flexibility to the maximum extent possible. Non-commuters expressed having more flexibility, and would be more likely to shift travel time to avoid peak period tolls.

Although responses between cities were largely similar, there were noteworthy differences. Philadelphia travelers repeatedly indicated that avoiding congestion is more likely to prompt changes in travel times and routes than avoiding an increased toll, whereas Pittsburgh travelers repeatedly indicated displeasure with toll increase scenarios. Philadelphia participants overall seemed to have less flexibility to commute during off peak times than Pittsburgh participants. Finally, Pittsburgh had at least twice as many participants than Philadelphia who are reimbursed by employers for turnpike trips.

### STATED PREFERENCE SURVEYS

The results of the focus groups were incorporated into the development of the stated preference surveys. RSG administered two stated preference surveys; one to passenger car motorists and one to commercial vehicle operators. The primary purpose of the stated preference surveys was to determine the willingness and ability of Turnpike patrons' to shift travel times in response to proposed value pricing scenarios.

***Passenger Car Surveys –*** The passenger car surveys were conducted by M. Davis and Company, Inc. in the Philadelphia study area and by John J. Clark & Associates in the Pittsburgh study area. All surveys were conducted via a computer. Some surveys were conducted at special sites typically close to a high-volume interchange in the study area, such as a mall, convention center, industrial park, airport, or Department of Transportation building. RSG conducted a total of 532 surveys at these sites, during June 20 through June 30, 2002.

An additional 1,263 passenger-car motorist surveys were collected over the Internet at SurveyCafe.net from June 24 through July 20, 2002. These individuals participated in the survey in response to several prompts including an invitation from an employer, a flyer or an e-mail invitation.

Potential respondents were screened to meet certain criteria, including that the motorist made a trip during a weekday that included at least one interchange in the study areas. In addition, the trip should be for the purpose of traveling to or from work, or a non-commute trip that was not for the purpose of air travel.

Each survey was composed of four main sections: origin-destination questions, current trip characteristics, stated preference experiments, and general demographics. The origin-destination questions asked respondents to indicate the interchanges where they entered and exited the Turnpike. The current trip questions obtained information about the respondent's one-way trip including method-of-payment, trip purpose, time of travel, and trip frequency.

The heart of the stated preference surveys takes place in the experiment section. The survey was constructed to obtain information from respondents' that would allow RSG to quantitatively estimate Turnpike patrons' decisions as the values of the following four trip attributes change; toll cost, method of payment, time period of travel, and trip route. Each participant was asked to make a series of choices based on three alternate trip conditions compared to the trip that the participant had just described. In each scenario, *Choice 1* was to make the trip using the Turnpike during Peak travel hours, *Choice 2* was to make the trip using the Turnpike during Off-Peak travel hours, and *Choice 3* was to make the trip via an alternate route. Within the first two of these trip alternatives (*Choice 1* and *Choice 2*) were variables of toll cost, toll payment method and 'time shift', which is the amount of time by which the trip would have to be shifted to take advantage of lower, off-peak tolls. The respondent was presented with different values for each of these variables, and was

asked to 'trade off' among the three Choice alternatives while the value of the variables changed independently from one another.

Lastly, several demographic questions were posed to the participants to allow a comparison of the sample to the total Turnpike patron universe. The demographic questions included household size, number of vehicles per household, age, gender, employment status, and annual household income.

In general, the value pricing component of the surveys found that motorists who currently pay cash would be much more likely to join E-ZPass for a toll discount, than to switch their travel times for a toll discount (or to avoid a peak period surcharge). Relatively large toll differentials would be required to alter motorists travel times. These findings largely agree with those found in the focus groups where motorists indicated they were already traveling at times to avoid as much congestion as possible.

***Commercial Vehicle Surveys*** – The commercial vehicle surveys were administered by M. Davis and Company, Inc. during the weeks of August 2 and August 9, 2002. Information was collected via telephone interviews with 25 trucking firms whose fleets regularly use the Turnpike in the study areas. Open-ended questions were asked on the topics of route choice, the effect of potential peak pricing, and the effect of potential E-ZPass on the commercial customers' businesses and choices.

Trucking company responses were somewhat more favorable to the concept of value pricing. Between 15 and 35 percent of those interviewed reported that they would shift the schedule of trucks in their fleet in order to take advantage of off-peak discounts or to avoid peak period surcharges

***Survey Uses*** – The results of the passenger car and commercial vehicle stated preference surveys, particularly the experiment section, were used in WSA's analysis of the traffic and toll revenue impacts that could be associated with the various value pricing scenarios. In addition, information from the origin-destination questions, the trip characteristics questions and the demographic questions was summarized by RSG to complete a current Turnpike patron profile. The specific information is summarized in Appendix A.

## MARKET RESEARCH

Frank Wilson & Associates conducted an extensive market research study, composed of a "benefit test" and a "stakeholder Interview." Some of the products of the market research included:

- Value Pricing White Paper;
- Value Pricing Backgrounder, a brief synopsis of the White Paper;
- Frequently Asked Questions, a prepared list of anticipated questions and answers regarding value pricing; and a
- Web Page Brief, a summary of a hypothetical web page for value pricing on the Turnpike.

The results of FW&A's market research and their products are all included in Appendix B, Frank Wilson & Associates Market Study, Documents For The Pennsylvania Turnpike Value Pricing Study.

### BENEFIT TEST

FW&A incorporated benefit testing as part of four focus groups that took place in Philadelphia on May 21 and Pittsburgh on May 22. These were the same focus groups that were used to develop the stated preference surveys by RSG. Benefit testing places key messages in front of focus group members to elicit their response to various benefits of a product or service. The benefit testing process helps to identify the values, benefits and attributes people associate with the product or service—in this case the concept of value pricing. The results are used to "brand" the project and frame key messages. This approach provides project sponsors with a means of talking about the value pricing project in a way that resonates with stakeholders and users. The results of the benefit testing can be incorporated into messages, technical reports, presentations, press materials and marketing.

As a result of that background research, 18 benefit messages were created, reviewed and revised by the project team. These benefit messages were placed on separate display boards and presented to the focus group participants by a facilitator.

The facilitator asked focus group participants to arrange the 18 benefit messages in rank order, based on their personal preference, from most important to least important. Participants were asked to discuss the benefits and, while their opinions on the most important benefit varied, some clear choices emerged from the discussion.

The top four benefits chosen by the focus group participants included:

1. E-ZPass saves me time at toll plazas. Now, with Value Pricing, I can save money too;
2. Using the Turnpike is less stressful than traveling on other, more congested highways;
3. Value Pricing is an idea whose time has come. It makes sense to use financial incentives to manage traffic congestion; and
4. If the Turnpike tolls are kept reasonably affordable with Value Pricing, I will continue to use the Turnpike.

Messages that the focus group participants found not credible or believable included:

1. Tolls on the Turnpike are already too high. With value pricing, the Turnpike can only be used by those who can afford the higher tolls during peak hours;
2. I like the environmental benefits of value pricing. It's good to know that it will help reduce congestion and air pollution;
3. Value Pricing will save me time whenever I travel on the Turnpike by reducing traffic congestion; and
4. Value pricing will save me time on my commute, and gives me more time for the things that are important in my life.

From the benefits that the focus group members rated highly, several messages were identified as potential to describing the value pricing project, including:

- "With E-ZPass and Value Pricing I can save time and money on the Turnpike."
- "Reducing traffic with Value Pricing is a matter of dollars and sense."
- "With Value Pricing's discount tolls, it pays to take the Turnpike."
- "With E-ZPass and discount tolls, it pays to take the Turnpike."
- "Taking the Turnpike means one less thing to stress over."

These messages can be further developed and implemented into a marketing communications tool if the value pricing program is implemented. The messages would serve to create a positive, believable identity for value pricing on the Turnpike.

### STAKEHOLDER INTERVIEW

In July and August 2002, 21 key stakeholders identified by PTC staff were interviewed about the proposed value pricing project. The purpose of the interviews was to identify the opinions, issues of concern and interests of stakeholders regarding the value pricing concept in general, and its application and potential value to the Turnpike.

Stakeholders were all persons whose opinions are valued by the PTC. Interviewees included appointed officials of the Pennsylvania Turnpike Commission, staff representing agencies directly or indirectly involved in project planning and design, and representatives from a broad range of transportation interest or advocacy groups. Stakeholders included;

- Two appointed officials from the PTC,
- Eleven staff representatives from agencies directly or indirectly involved in project planning and design,
  - PennDOT,
  - Pennsylvania Turnpike Executive/Senior Management,
- Eight representatives of a range of transportation interest or advocacy groups.
  - Upper Marion Township
- Transportation Management Associations (TMA) in:
  - Bristol, PA
  - Media, PA
  - King of Prussia, PA
  - North Wales, PA
  - Malvern, PA
  - Wilmington, DE
  - Marlton, NJ

In order to assess the stakeholder attitudes and opinions, FW&A, with input from WSA and the PTC used a semi-structured interview to elicit insights on the following topics:

- General perceptions of the Turnpike and E-ZPass;
- Perceptions for implementing value pricing;
- Stakeholder suggestions for outreach efforts;
- Potential problems; and
- Equity issues that may arise out of implementation on value pricing.

Figure 2-1 illustrates stakeholders' positions on the potential for initiating value pricing on the Turnpike. The stakeholder's answers are ranked by their organization. Those who could not provide support or opposition for value pricing offered some supporting commentary.

FIGURE 2-1 – Stakeholder Support and Opposition for Value Pricing

| Affiliation | Support | Oppose | Not Sure or Neutral | If Unsure, Why Are You Unsure? |
|---|---|---|---|---|
| PENNDOT | 2 | 4 | 1 | • It will be a controversial program<br>• The response will be mixed<br>• It may work, but it will be a media nightmare |
| PTC Executive Staff | 1 | 0 | 3 | • It won't work on the Turnpike<br>• I had a higher opinion a year ago<br>• It depends on the definition of value pricing; time of day pricing won't work |
| PTC Commissioners | 0 | 1 | 1 | • It will cause congestion on other roads<br>• It will be difficult because there is already too much construction going on and this state resists change |
| TMA Executive Directors | 5 | 0 | 2 | • I prefer the electronic interchanges<br>• It has value, but I'm not sure of the results |
| City Management | 1 | 0 | 0 | |
| **Total** | **9** | **5** | **7** | |

Stakeholders were asked to choose a favored value pricing option among four generalized options. The four options are described below:

- Option A: Overall discounted tolls for E-ZPass customers,
- Option B: Give E-ZPass customers a discount during off-peak drive times,
- Option C: Overall increased tolls during peak usage to get drivers with a more flexible commute time to drive during off-peak hours, and
- Option D: A larger discount in tolls for E-ZPass customers for traveling during off-peak instead of peak hours.

Option A was the first choice among the 21 stakeholders. Figure 2-2 shows the stakeholders' preferences for the value pricing option as ranked by their agency.

FIGURE 2-2 – Stakeholder Preference for the Value Pricing Options – By Agency

| Affiliation | Option A | Option B | Option C | Option D | None |
|---|---|---|---|---|---|
| PENNDOT | 2 | 0 | 2 | 2 | 1 |
| PTC Executive Staff | 3 | 0 | 0 | 1 | 0 |
| PTC Commissioners | 0 | 0 | 0 | 1 | 1 |
| TMA Executive Directors | 4 | 0 | 1 | 2 | 0 |
| City Management | 0 | 0 | 0 | 0 | 1 |
| **TOTAL** | **9** | **0** | **3** | **6** | **3** |

Stakeholders were also asked to consider which value pricing option would make the greatest contribution to reducing congestion on the Turnpike. The answers are presented in Figure 2-3.

FIGURE 2-3 – Greatest Potential Contribution to Congestion Reduction – By Agency

| Affiliation | Option A | Option B | Option C | Option D | None |
|---|---|---|---|---|---|
| PENNDOT | 1 | 0 | 3 | 1 | 2 |
| PTC Executive Staff | 2 | 0 | 1 | 0 | 1 |
| PTC Commissioners | 0 | 0 | 1 | 0 | 1 |
| TMA Executive Directors | 4 | 0 | 1 | 2 | 0 |
| City Management | 0 | 0 | 0 | 0 | 1 |
| **TOTAL** | **7** | **0** | **6** | **3** | **5** |

The issue of what groups may be likely or not likely to support value pricing was explored with the stakeholders. Environmentalists, E-ZPass patrons, commuters and young motorists were deemed likely to support or look favorably upon value pricing. It was thought that trucking associations and some legislators may be opposed to value pricing. These results are summarized in Figure 2-4.

FIGURE 2-4 – Stakeholder Perceptions of Likely Supporters and Opponents of Value Pricing

| Affiliation | Potential Supporters | Potential Opposition |
|---|---|---|
| PENNDOT | • E-ZPass Users<br>• Business Community<br>• Commuters with flexible schedules<br>• Younger generation | • Trucking Associations<br>• Legislators<br>• Impacted commuters<br>• Non-E-ZPass commuters |
| PTC Executive Staff | • Federal Highway Administration<br>• Commuters<br>• Legislators | • Trucking Industry<br>• Commuters<br>• Elected Officials<br>• Bond Rating Agencies |
| PTC Commissioners | • Areas with heavy commercial traffic | • PTC if it cuts into revenues<br>• There will be less opposition in Philadelphia |
| TMA Executive Directors | • All but one stakeholder from this group said nobody would support value pricing<br>• Current commuters<br>• Regional businesses | • Commuters<br>• Non-E-ZPass customers<br>• Truckers and Trucking Associations<br>• AAA<br>• Clean Air groups |
| City Management | • None | • Commuters |

### OTHER PRODUCTS

FW&A also prepared a Value Pricing White Paper, a Value Pricing Backgrounder, a Frequently Asked Questions and Answers, and a Web Page Brief. All of these products are presented in Appendix B.

The White Paper and the Backgrounder both offer a description of value pricing, and a summary of some of the toll facilities that have operating value pricing programs. The Frequently Asked Questions and Answers is a finished product that poses anticipated questions about value pricing and simple answers. These are suitable for use as basic public information. Lastly, the Web Page Brief lays out the basis for a proposed web page on the value pricing program for the Turnpike.

# CHAPTER 3

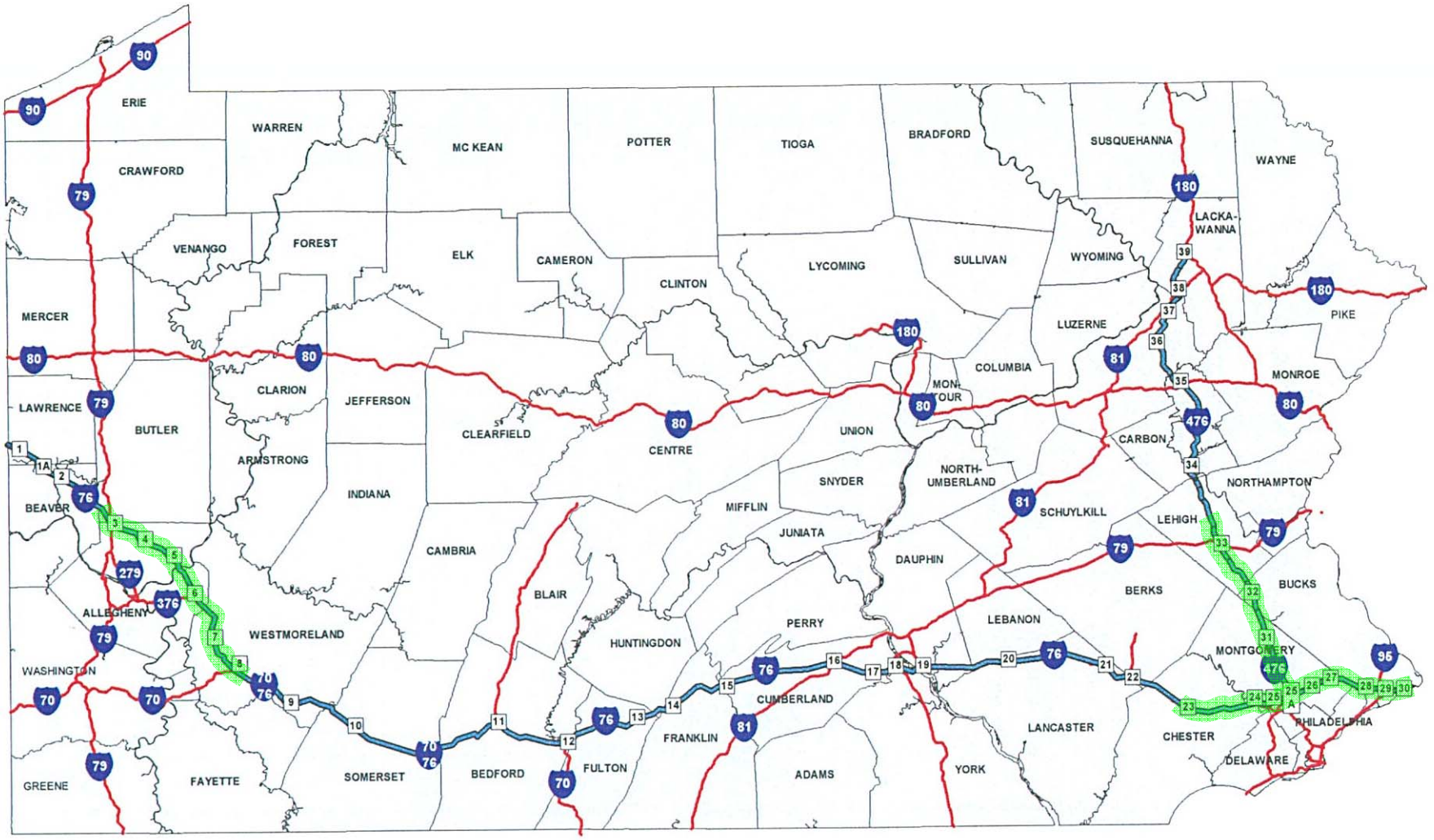
# TRAFFIC DATA COLLECTION

A large amount of data was collected and analyzed by WSA for use in evaluating the proposed value pricing strategies on the Pennsylvania Turnpike. The primary purpose of the data collection was the establishment of a detailed profile of weekday traffic conditions on the Turnpike prior to the proposed implementation of value pricing. The data collection effort centered on the urban areas around Pittsburgh, Philadelphia and Allentown, Pennsylvania because these congested areas were the focus of the value pricing study. The detailed traffic data collection areas are highlighted in Figure 3-1.

In the Pittsburgh area, the detailed study area extended from Interchange 4/36 (Butler Valley) to Interchange 8/75 (New Stanton), a distance of about 39 miles on Interstate I-76. Toll Facilities at Interchange 3/28 (Cranberry) were not evaluated as they are slated for removal. The detailed study area around Philadelphia and Allentown covered the interchanges from 23/312 (Downingtown) to 30/359 (Delaware River Bridge) on Interstates I-76 and I-276 (about 47 miles), and Interchanges 25A/20 (Mid-County) to 33/56 9 (Lehigh Valley) on I-476 (about 37 miles), respectively.

All data were collected on Tuesdays, Wednesdays, or Thursdays to represent typical weekday conditions. Most data were collected in May and June 2002, excluding the weeks before and after the Memorial Day weekend. The data collection falls into the following five categories, each of which will be described in subsequent sections:

1. 48-hour machine counts at all approaches to the entering and exiting toll plaza lanes.
2. 48-hour machine counts at select mainline sections of the Turnpike by direction.
3. Quantification of vehicle queues by lane at toll plazas (both entry and exit lanes) during weekday A.M. and P.M. peak periods.
4. Travel time studies in each study area during the A.M., P.M., and midday time periods, and

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## TRAFFIC DATA COLLECTION AREAS ON THE PENNSYLVANIA TURNPIKE

FIGURE 3-1

5. Aerial photographs of each interchange in the study areas during the A.M. and P.M. peak periods.

A list of the interchanges where data collection took place is shown in Table 3-1. Also shown is a list of the seven mainline sections where directional counts were collected. Two mainline sections were counted on I-76 in the Pittsburgh area, and five mainline sections were counted in the Philadelphia/Allentown areas (one on I-76, three on I-276, and one on I-476).

The complete set of collected data is contained in a separate document, Appendix C: Technical Memorandum, Summary of Data Collection. The rest of this chapter summarizes WSA's data collection efforts and presents examples of the collected information.

## 48-HOUR MACHINE COUNTS

Total volume machine counts were conducted over a 48-hour period at all ramp approaches to entering and exiting toll plaza lanes in the detailed study area. The count locations were selected to avoid areas where queues may develop on approaches to the toll plazas. The counts allowed WSA to develop traffic profiles representing the total traffic entering and exiting the interchange on a typical weekday. Two-day (48-hour) directional machine counts were also conducted at seven mainline locations on the Turnpike. Count locations are listed in Table 1. All counts were conducted on either a Tuesday/Wednesday or a Wednesday/Thursday combination, and were recorded in 15-minute increments.

The traffic count data will be used for several tasks including:

1. Developing a baseline weekday profile of traffic demand during A.M. and P.M. peak periods along the Turnpike.

2. As input to TOLLSIM (WSA's proprietary toll plaza modeling program) to develop a baseline model of current traffic operating conditions at the toll plazas, including queue lengths and average vehicle delay.

An example of the collected data is presented in Table 3-2 for Interchange 28/351 (Philadelphia). Table 3-2 shows the hourly traffic volume entering the Turnpike, and the percent of the total daily traffic that each hourly volume represents. All the interchange counts are presented in Appendix C in Tables 2 through 37.

# Table 3-1

## Data Collection Sites

**Data Collection Sites at PA Turnpike Toll Plazas**

| Interchange Name | Interchange Number | Turnpike Location | Primary Data Collection Period |
|---|---|---|---|
| Butler Valley | 4/39 | I-76 | May, 2002 |
| Allgheny Valley | 5/48 | I-76 | May, 2002 |
| Pittsburgh | 6/57 | I-76 | May, 2002 |
| Irwin | 7/67 | I-76 | May, 2002 |
| New Stanton | 8/75 | I-76 | May, 2002 |
| Downingtown | 23/312 | I-76 | June 2002 |
| Valley Forge | 24/326 | I-76 | June 2002 |
| Norristown | 25/333 | I-276 | June 2002 |
| Mid-County | 25A/20 | I-276/I-476 | June 2002 |
| Fort Washington | 26/339 | I-276 | June 2002 |
| Virginia Drive | 340 | I-276 | June 2002 |
| Willow Grove | 27/343 | I-276 | June 2002 |
| Philadelphia | 28/351 | I-276 | June 2002 |
| Delaware Valley | 29/358 | I-276 | June 2002 |
| Delaware River Bridge | 30/359 | I-276 | June 2002 |
| Lansdale | 31/31 | I-476 | June 2002 |
| Quakertown | 32/44 | I-476 | June 2002 |
| Lehigh Valley | 33/56 | I-476 | June 2002 |

**Data Collection Sites at PA Turnpike Mainline Locations**

| Section | Section Between Interchanges | Turnpike Location | Primary Data Collection Period |
|---|---|---|---|
| Section 1 | 5/48 - 6/57 | I-76 | June 2002 |
| Section 2 | 6/57 - 7/67 | I-76 | June 2002 |
| Section 3 | 23/312 - 24/326 | I-76 | June 2002 |
| Section 4 | 25/333 - 25A/20 | I-276 | June 2002 |
| Section 5 | 25A/20 - 26/339 | I-276 | June 2002 |
| Section 6 | 28/351 - 29/358 | I-276 | June 2002 |
| Section 7 | 31/31 - 32/44 | I-476 | June 2002 |

# Table 3-2
# Hourly Traffic Entering The Turnpike (1)
# Interchange 28/351 (Philadelphia)

| Hour Begin | Tuesday 5/14/2002 | Percent of Total Day | Wednesday 5/15/2002 | Percent of Total Day |
|---|---|---|---|---|
| Midnight | 258 | 0.7 | 284 | 0.7 |
| 1:00 | 185 | 0.5 | 202 | 0.5 |
| 2:00 | 163 | 0.4 | 171 | 0.4 |
| 3:00 | 224 | 0.6 | 197 | 0.5 |
| 4:00 | 384 | 1.0 | 398 | 1.0 |
| 5:00 | 1,282 | 3.4 | 1,265 | 3.3 |
| 6:00 | 3,208 | 8.6 | 3,322 | 8.7 |
| 7:00 | 3,818 | 10.2 | 3,856 | 10.1 |
| 8:00 | 3,119 | 8.3 | 3,142 | 8.2 |
| 9:00 | 2,344 | 6.3 | 2,261 | 5.9 |
| 10:00 | 1,805 | 4.8 | 1,855 | 4.8 |
| 11:00 | 1,745 | 4.7 | 1,748 | 4.6 |
| 12:00 | 1,677 | 4.5 | 1,753 | 4.6 |
| 13:00 | 1,767 | 4.7 | 1,813 | 4.7 |
| 14:00 | 1,860 | 5.0 | 1,966 | 5.1 |
| 15:00 | 2,211 | 5.9 | 2,205 | 5.8 |
| 16:00 | 2,450 | 6.5 | 2,531 | 6.6 |
| 17:00 | 2,862 | 7.6 | 2,717 | 7.1 |
| 18:00 | 1,975 | 5.3 | 2,060 | 5.4 |
| 19:00 | 1,211 | 3.2 | 1,325 | 3.5 |
| 20:00 | 995 | 2.7 | 1,075 | 2.8 |
| 21:00 | 862 | 2.3 | 959 | 2.5 |
| 22:00 | 625 | 1.7 | 693 | 1.8 |
| 23:00 | 435 | 1.2 | 477 | 1.2 |
| Total | 37,465 | 100.0 | 38,275 | 100.0 |

(1) Based on machine counts conducted by The Traffic Group.

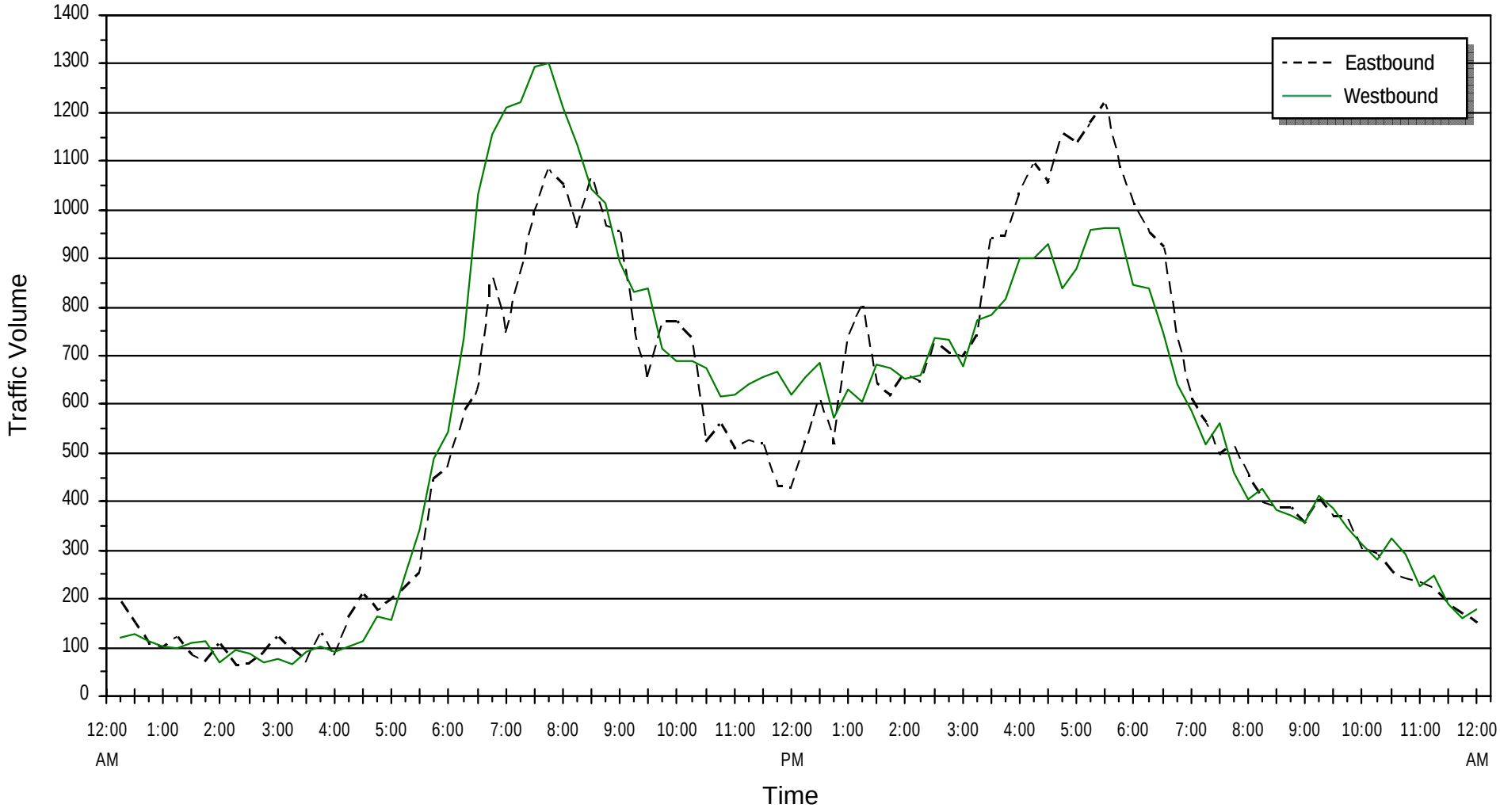
The interchange counts represent the real demand at each toll plaza for traffic entering and exiting the Turnpike. Toll transaction count data, on the other hand, only reflects the processing capacity of the toll plaza. In conducting plaza operating analyses, WSA requires the real demand (or arrival rates) in order to accurately reflect the queuing dynamics at each plaza. The difference between the real demand and the transaction data is most apparent at plazas where significant queues develop, such as at Interchange 24 (Valley Forge), or Interchange 27 (Willow Grove). In addition, the transaction counts on the entering side of the toll plazas are available from the PTC only on a daily basis, not in smaller time increments.

Summaries of the mainline section counts are presented in Appendix C, Tables 38 through 51 in a similar format to the interchange counts. It was not necessary to conduct counts on all mainline segments since the missing segments could be accurately estimated using a combination of mainline counts and interchange counts.

The data from the machine counts was also summarized in a series of graphics. An example is presented in Figure 3-2, which illustrates the traffic counts by direction on the mainline section of Interstate 276 between Interchanges 27/343 and 28/351 in 15 minute intervals. Graphic data is presented for all the interchange locations in the detailed study area in Appendix C in Figures 2 through 19, and for the mainline locations in Figures 20 through 26. Each figure clearly shows when the peak periods occur, whether the A.M. and P.M. peak periods are symmetrical, and whether there is substantial midday demand.

Lastly, the traffic counts were summarized in tabular form in 15-minute intervals during the A.M. and P.M. peak periods for the ramp and mainline locations. During the A.M., counts are shown for the peak period from 6:00 through 9:00 A.M., and an additional shoulder hour is shown on either side of the peak period. The P.M. peak period is defined from 3:00 through 6:00 P.M. Traffic counts are also shown for a shoulder hour on either side of the peak period.

Tables 3-3 and 3-4 present examples of the 15-minute traffic counts for the interchange and mainline locations, respectively. The complete data set is provided in Appendix C in Tables 52 through 55 (interchange locations) and Tables 56 through 59 (mainline locations).




Source: Machine counts conducted
By The Traffic Group

Wilbur Smith Associates
ENGINEERS
PLANNERS
ECONOMISTS

## FIFTEEN MINUTE TRAFFIC COUNTS
## I-276 MAINLINE SECTION BETWEEN INTERCHANGES 27/343 AND 28/35

Wednesday May 22, 2002

FIGURE 3-2

**Table 3-3**
**Entering PM Peak Period Traffic Volumes by Interchange**
**In 15 Minutes Increments (1)**
**Pennsylvania Turnpike**

| PM Time Begins | Pittsburgh Area Plazas | | | | | Philadelphia Area Plazas | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4/39 | 5/48 | 6/57 | 7/67 | 8/75 | 23/312 | 24/326 | 25/333 | 25A/20 | 26/339 | 340 (2) | 27/343 | 28/351 | 29/358 | 30/359 | 31/31 | 32/44 | 33/56 |
| 2:00 | 83 | 173 | 387 | 152 | 406 | 375 | 461 | 217 | 455 | 375 | 14 | 413 | 471 | 133 | 367 | 160 | 117 | 284 |
| 2:15 | 88 | 162 | 409 | 120 | 377 | 403 | 488 | 240 | 499 | 403 | 14 | 447 | 478 | 141 | 342 | 195 | 127 | 312 |
| 2:30 | 103 | 160 | 383 | 173 | 400 | 392 | 471 | 228 | 498 | 392 | 26 | 446 | 546 | 170 | 362 | 186 | 111 | 346 |
| 2:45 | 85 | 192 | 451 | 164 | 393 | 398 | 522 | 232 | 543 | 398 | 17 | 438 | 471 | 168 | 368 | 209 | 123 | 311 |
| 3:00 | 122 | 221 | 465 | 163 | 374 | 449 | 599 | 293 | 551 | 449 | 30 | 493 | 512 | 172 | 389 | 209 | 115 | 327 |
| 3:15 | 108 | 267 | 454 | 183 | 378 | 556 | 612 | 355 | 657 | 556 | 37 | 562 | 550 | 172 | 430 | 198 | 137 | 369 |
| 3:30 | 157 | 333 | 508 | 183 | 440 | 541 | 679 | 312 | 700 | 541 | 39 | 565 | 556 | 182 | 415 | 223 | 144 | 431 |
| 3:45 | 160 | 290 | 522 | 188 | 467 | 507 | 694 | 344 | 744 | 507 | 40 | 592 | 587 | 202 | 431 | 244 | 148 | 375 |
| 4:00 | 141 | 312 | 561 | 168 | 378 | 532 | 803 | 430 | 784 | 532 | 56 | 658 | 580 | 206 | 422 | 260 | 134 | 366 |
| 4:15 | 117 | 335 | 654 | 188 | 404 | 586 | 765 | 457 | 817 | 586 | 55 | 582 | 647 | 190 | 393 | 237 | 125 | 353 |
| 4:30 | 157 | 337 | 608 | 193 | 398 | 533 | 869 | 475 | 892 | 533 | 78 | 662 | 596 | 213 | 463 | 292 | 135 | 417 |
| 4:45 | 154 | 353 | 636 | 176 | 531 | 568 | 827 | 447 | 870 | 568 | 86 | 648 | 708 | 207 | 465 | 265 | 140 | 421 |
| 5:00 | 151 | 383 | 632 | 172 | 456 | 673 | 832 | 535 | 936 | 673 | 105 | 680 | 651 | 196 | 436 | 270 | 132 | 437 |
| 5:15 | 186 | 402 | 643 | 182 | 420 | 658 | 775 | 533 | 952 | 658 | 96 | 693 | 723 | 225 | 436 | 301 | 167 | 441 |
| 5:30 | 145 | 322 | 615 | 182 | 370 | 598 | 729 | 456 | 862 | 598 | 106 | 665 | 722 | 275 | 430 | 300 | 126 | 350 |
| 5:45 | 130 | 243 | 472 | 133 | 302 | 544 | 744 | 387 | 794 | 544 | 88 | 608 | 621 | 189 | 420 | 252 | 114 | 343 |
| 6:00 | 125 | 230 | 464 | 120 | 335 | 514 | 625 | 344 | 663 | 514 | 63 | 550 | 658 | 227 | 361 | 211 | 117 | 313 |
| 6:15 | 92 | 170 | 424 | 118 | 345 | 432 | 559 | 294 | 657 | 432 | 49 | 482 | 572 | 177 | 355 | 204 | 112 | 263 |
| 6:30 | 111 | 143 | 359 | 94 | 328 | 317 | 452 | 244 | 561 | 317 | 46 | 386 | 439 | 152 | 311 | 183 | 76 | 259 |
| 6:45 | 88 | 162 | 340 | 102 | 324 | 306 | 401 | 198 | 455 | 306 | 21 | 324 | 391 | 127 | 308 | 156 | 100 | 206 |
| Total | 2,503 | 5,190 | 9,987 | 3,154 | 7,826 | 9,882 | 12,907 | 7,021 | 13,890 | 9,882 | 1,066 | 10,894 | 11,479 | 3,724 | 7,904 | 4,555 | 2,500 | 6,924 |

(1) Count data is from machine counts conducted on Tuesdays, Wednesdays, or Thursdays in either May or June 2002 by The Traffic Group. Counts were located on ramps that approaced the toll plazas.
(2) This is the ETC slip ramp at Virginia Drive.
NOTE: The shaded area generally represents the three-hour AM peak period.

**Table 3-4**
**PM Peak Period Traffic Volumes By Mainline Section in the Philadelphia Area**
**In 15 Minutes Increments (1)**
**Pennsylvania Turnpike**

| PM Time Begins | Mainline Section Between Interchanges: 23/312 to 24/326 | | | 25/333 to 25A/20 | | | 25A/20 to 26/339 | | | 27/343 to 28/351 | | | 31/31 to 32/44 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Eastbound | Westbound | Total | Eastbound | Westbound | Total | Eastbound | Westbound | Total | Eastbound | Westbound | Total | Northbound | Southbound | Total |
| 2:00 | 318 | 327 | 645 | 553 | 536 | 1,089 | 847 | 924 | 1,771 | 644 | 661 | 1,305 | 442 | 332 | 774 |
| 2:15 | 365 | 400 | 765 | 612 | 497 | 1,109 | 875 | 938 | 1,813 | 725 | 736 | 1,461 | 388 | 312 | 700 |
| 2:30 | 356 | 424 | 780 | 641 | 538 | 1,179 | 872 | 910 | 1,782 | 703 | 734 | 1,437 | 388 | 366 | 754 |
| 2:45 | 316 | 414 | 730 | 698 | 534 | 1,232 | 903 | 1,012 | 1,915 | 696 | 678 | 1,374 | 461 | 357 | 818 |
| 3:00 | 327 | 466 | 793 | 715 | 557 | 1,272 | 964 | 1,052 | 2,016 | 741 | 773 | 1,514 | 401 | 347 | 748 |
| 3:15 | 382 | 438 | 820 | 802 | 575 | 1,377 | 1,102 | 1,097 | 2,199 | 942 | 784 | 1,726 | 502 | 379 | 881 |
| 3:30 | 373 | 483 | 856 | 837 | 587 | 1,424 | 1,122 | 1,187 | 2,309 | 944 | 818 | 1,762 | 579 | 394 | 973 |
| 3:45 | 452 | 501 | 953 | 862 | 620 | 1,482 | 1,266 | 1,111 | 2,377 | 1,030 | 900 | 1,930 | 602 | 380 | 982 |
| 4:00 | 363 | 497 | 860 | 966 | 667 | 1,633 | 1,239 | 1,170 | 2,409 | 1,093 | 899 | 1,992 | 528 | 366 | 894 |
| 4:15 | 401 | 571 | 972 | 907 | 743 | 1,650 | 1,310 | 1,225 | 2,535 | 1,052 | 928 | 1,980 | 563 | 370 | 933 |
| 4:30 | 404 | 493 | 897 | 1,025 | 739 | 1,764 | 1,418 | 1,223 | 2,641 | 1,155 | 838 | 1,993 | 623 | 367 | 990 |
| 4:45 | 396 | 615 | 1,011 | 964 | 732 | 1,696 | 1,423 | 1,176 | 2,599 | 1,133 | 878 | 2,011 | 654 | 357 | 1,011 |
| 5:00 | 469 | 603 | 1,072 | 1,054 | 787 | 1,841 | 1,325 | 1,189 | 2,514 | 1,176 | 960 | 2,136 | 683 | 390 | 1,073 |
| 5:15 | 496 | 677 | 1,173 | 1,026 | 752 | 1,778 | 1,360 | 1,222 | 2,582 | 1,219 | 962 | 2,181 | 594 | 390 | 984 |
| 5:30 | 434 | 641 | 1,075 | 959 | 760 | 1,719 | 1,292 | 1,278 | 2,570 | 1,090 | 964 | 2,054 | 556 | 364 | 920 |
| 5:45 | 389 | 560 | 949 | 871 | 735 | 1,606 | 1,294 | 1,132 | 2,426 | 1,013 | 847 | 1,860 | 544 | 330 | 874 |
| 6:00 | 336 | 457 | 793 | 764 | 744 | 1,508 | 1,126 | 1,132 | 2,258 | 953 | 840 | 1,793 | 488 | 341 | 829 |
| 6:15 | 340 | 432 | 772 | 774 | 627 | 1,401 | 1,268 | 1,150 | 2,418 | 924 | 749 | 1,673 | 418 | 300 | 718 |
| 6:30 | 315 | 331 | 646 | 612 | 596 | 1,208 | 925 | 994 | 1,919 | 734 | 642 | 1,376 | 361 | 260 | 621 |
| 6:45 | 255 | 307 | 562 | 655 | 449 | 1,104 | 809 | 820 | 1,629 | 610 | 587 | 1,197 | 313 | 237 | 550 |
| Total | 7,487 | 9,637 | 17,124 | 16,297 | 12,775 | 29,072 | 22,740 | 21,942 | 44,682 | 18,577 | 16,178 | 34,755 | 10,088 | 6,939 | 17,027 |

(1) Count data is from machine counts conducted on Tuesdays, Wednesdays, or Thursdays in either May or June 2002 by The Traffic Group.
NOTE: The shaded area generally represents the three-hour peak period.

## TOLL PLAZA QUEUING OBSERVATIONS

Queuing observations were conducted by WSA at all toll plazas in the detailed study area with the exception of the Virginia Drive slip ramp, which only permits E-ZPass transactions. During preliminary field reconnaissance, congestion did not develop at the Virginia Drive slip ramp, so queuing observations were not necessary.

Queuing observations were collected on a Tuesday, Wednesday or Thursday in May or June 2002. Personnel were stationed at each plaza, generally between 6:00 through 9:30 A.M. and 3:30 through 6:30 P.M. The goal was to quantify the queues that develop in each lane (both entry and exit lanes) and to observe queuing conditions on both the approach and departure from the toll plazas. WSA personnel recorded the queue in each lane once every 10 minutes, and took notes and photographs to document traffic flow in and around the toll plaza. If queues exceeded approximately 25 vehicles, the number of vehicles in the queue was estimated based on the queue length and an estimate of the average spacing between vehicles.

An example of the data collected is shown in Table 3-5 for plaza 26/339 (Fort Washington). The table shows the queued vehicles observed in each lane in each 10-minute interval during the A.M. peak period. Both the entry and exit lane conditions are shown. The table also presents comments to describe any events that were observed at the toll plaza. The complete data set is provided in Appendix C in Tables 60 through 93.

The data was used in the TOLLSIM model to calibrate the between arrival rates (traffic counts), transaction times for each vehicle payment type (cash versus E-ZPass) and queue lengths (delay). The calibrated models of each toll plaza will be used to analyze potential changes in average vehicle delay due to the implementation of the proposed value pricing scenario.

## TRAVEL TIME STUDIES ON TURNPIKE SECTIONS

Travel Time (speed and delay) studies were conducted on three sections of the Turnpike during both peak and midday periods. The three sections consisted of the following areas:

1. On I-76 between Interchange 4/39 (Butler Valley) through Interchange 8/75 (New Stanton);

**Table 3-5**
**Observed Vehicle Queues Per Lane**
**Plaza 26 / 339 Fort Washington**
**A.M. Peak Period - May 15, 2002**

| Time Begin (A.M.) | Traffic Entering the Pennsylvania Turnpike | | | | Traffic Exiting the Pennsylvania Turnpike | | | | | | | | Time Begin (A.M.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane # | 1 | 2 | 3 | 4 | 5 | | 6 | | 7 | 8 | 9 | 10 | |
| Lane Type | SE | EE | TE | SE | MX | AX | SX | AX | TX | EX | SX | SX | |
| 06:00 | 2 | 0 | 0 | 0 | 0 | S | 2 | S | 0 | 0 | 0 | 0 | 06:00 |
| 06:10 | 3 | 1 | 2 | 1 | 0 | S | 1 | S | 0 | 0 | 0 | 0 | 06:10 |
| 06:20 | 0 | 2 | 0 | 0 | 0 | S | 0 | S | 0 | 0 | 0 | 1 | 06:20 |
| 06:30 | 2 | 1 | 2 | 1 | 3 | S | 0 | S | 0 | 0 | 0 | 0 | 06:30 |
| 06:40 | 0 | 1 | 3 | 2 | 3 | S | 4 | S | 3 | 0 | 2 | 3 | 06:40 |
| 06:50 | 6 | 3 | 1 | 2 | 4 | S | 2 | S | 5 | 0 | 4 | 2 | 06:50 |
| 07:00 | 2 | 3 | 2 | 2 | 3 | S | 4 | S | 3 | 1 | 3 | 2 | 07:00 |
| 07:10 | 1 | 2 | 2 | 3 | 2 | S | 1 | S | 0 | 0 | 0 | 0 | 07:10 |
| 07:20 | 8 | 8 | 6 | 5 | 5 | S | 2 | S | 0 | 0 | 1 | 4 | 07:20 |
| 07:30 | 16 | 12 | 11 | 8 | 3 | S | 0 | S | 2 | 1 | 0 | 0 | 07:30 |
| 07:40 | 11 | 15 | 16 | 12 | 0 | S | 3 | S | 3 | 8 | 2 | 1 | 07:40 |
| 07:50 | 6 | 15 | 14 | 2 | 3 | S | 1 | S | 1 | 0 | 2 | 1 | 07:50 |
| 08:00 | 10 | 12 | 15 | 7 | 0 | S | 1 | S | 2 | 2 | 2 | 2 | 08:00 |
| 08:10 | 4 | 6 | 6 | 5 | 1 | S | 0 | S | 4 | 2 | 1 | 0 | 08:10 |
| 08:20 | 4 | 2 | 1 | 0 | 2 | S | 0 | S | 1 | 1 | 4 | 6 | 08:20 |
| 08:30 | 15 | 21 | 22 | 13 | 5 | S | 4 | S | 3 | 1 | 0 | 1 | 08:30 |
| 08:40 | 9 | 16 | 20 | 15 | 2 | S | 0 | S | 1 | 1 | 1 | 2 | 08:40 |
| 08:50 | 10 | 16 | 18 | 14 | 2 | S | 4 | S | 3 | 3 | 1 | 0 | 08:50 |
| 09:00 | 18 | 16 | 23 | 22 | 4 | S | 2 | S | 3 | 3 | 2 | 3 | 09:00 |
| 09:10 | 14 | 46 | 37 | 30 | 3 | S | 3 | S | 2 | 1 | 4 | 3 | 09:10 |
| 09:20 | 12 | 40 | 30 | 30 | 2 | S | 3 | S | 3 | 0 | 2 | 1 | 09:20 |
| 09:30 | 13 | 20 | 12 | 10 | 6 | S | 5 | S | 4 | 1 | 3 | 3 | 09:30 |

Traffic congestion on westbound I-276 caused traffic to back up on the westbound entry ramp through the toll plaza entry lanes. This occurred from 8:30 through 9:40 A.M.

SE: Scale Entry (All Vehicles)
AE: Automatic Entry (Cars Only)
EE: E-ZPass Entry Only (Cars Only)
TE: E-ZPass and Ticket Entry (All Vehicles)
X: Lane Closed

SX: Scale Exit (All Vehicles)
EX: E-ZPass Exit Only (Cars Only)
TX: E-ZPass and Ticket Exit (All Vehicles)
AX: Tandem Booth
MX: Manual Exit (Cars Only)
S: Single Booth Operation

2. On I-76 and I-276 between Interchange 23/312 (Downingtown) and 30/359 (Delaware River Bridge); and

3. On I-476 between Interchange 25A/20 (Mid-County) and 33/56 (Lehigh Valley).

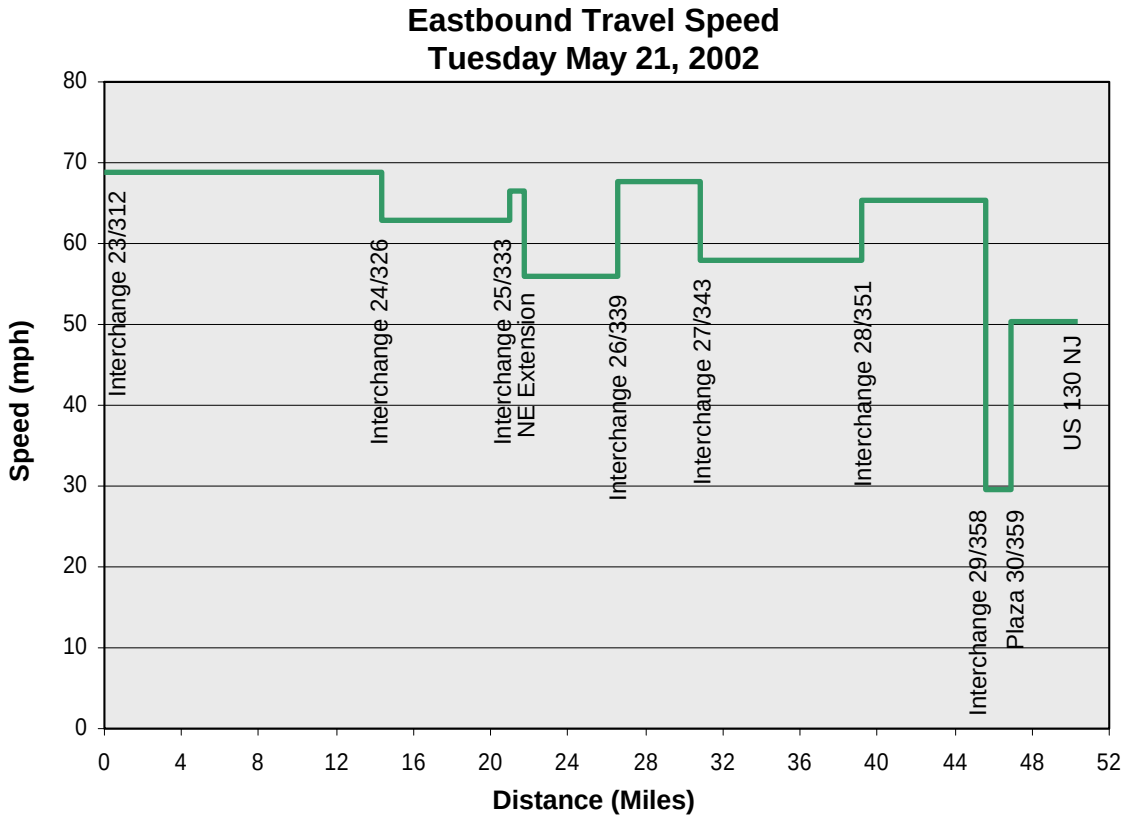
Multiple runs were made in each direction during the A.M., P.M. and midday periods. The time and distance traveled were recorded at preset checkpoints along the roadway. Comments were also recorded relating to roadway geometry, traffic conditions, and adjacent land uses.

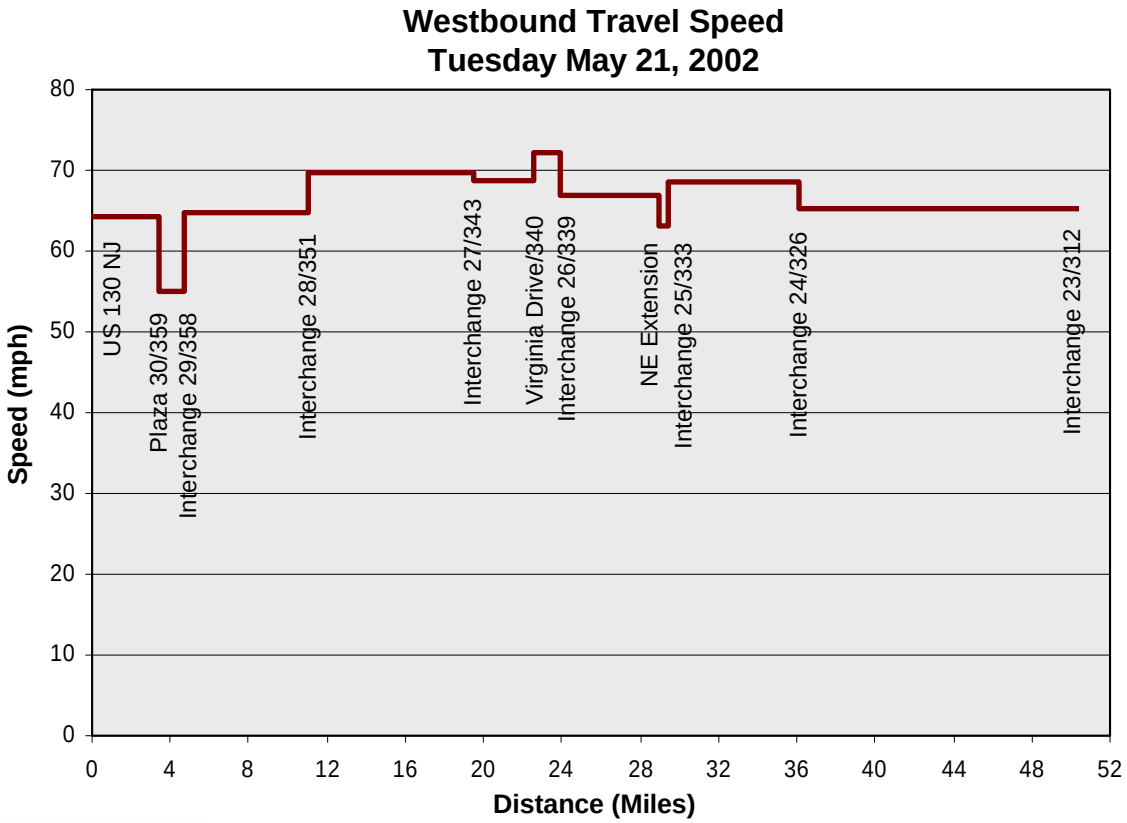
The travel time studies were conducted to reflect the travel speeds during a through trip on the mainline section. The driver was free to use the middle or leftmost travel lane to make the trip. If the driver was restricted to the right-most mainline lane, average travel speed would likely have declined from that reported due to the congestion surrounding the busiest interchanges, such as Valley Forge (24/326) or Willow Grove (27/343).

The data from the travel time studies was reduced and summarized into graphics for sections of the Turnpike. An example is shown in Figure 3-3, for the mainline roadway between Interchanges 23/312 (Downingtown) and 30/359 (Delaware River Bridge) in the eastbound direction. The average speed and distance between each interchange on the roadway is graphically portrayed. The full series of travel time graphics are located in Appendix C in Figures 27 through 35 by time period (A.M., P.M., and midday periods) and by direction.

The travel time studies indicated that, for the most part, travel speeds on the mainline sections of the Turnpike generally range in the 50-70 mph. Sections of the mainline where vehicles must pass through a toll plaza, such as Interchange 30/359 (Delaware River Bridge) or Interchange 25A/20 (Mid-County) the travel speeds are generally reduced, sometimes into the mid 30 mph range, as vehicles slowed to pass through the toll plaza, perhaps encountering a queue.

It was generally found that relatively little delay occurred on the through lanes of the Turnpike mainline segments. As indicated above, the most consistent delay occurred at the toll plazas or on approaches to the toll plazas. This information was used in estimating the potential level of service impacts associated with value pricing. It also provided valuable up-to-date speed data which was incorporated into all modeling work.


Eastbound Travel Speed
Tuesday May 21, 2002
Speed (mph)
Distance (Miles)
Interchange 23/312
Interchange 24/326
Interchange 25/333
NE Extension
Interchange 26/339
Interchange 27/343
Interchange 28/351
Interchange 29/358
Plaza 30/359
US 130 NJ


Westbound Travel Speed
Tuesday May 21, 2002
Speed (mph)
Distance (Miles)
US 130 NJ
Plaza 30/359
Interchange 29/358
Interchange 28/351
Interchange 27/343
Virginia Drive/340
Interchange 26/339
NE Extension
Interchange 25/333
Interchange 24/326
Interchange 23/312

## AERIAL PHOTOGRAPHS OF THE TOLL PLAZAS

Photographs were taken of each toll plaza in the detailed study area during a Tuesday, Wednesday or Thursday in either June or July 2002 during the A.M. and P.M. peak periods. The purpose of the photographs was to visually document traffic conditions prior to the proposed value pricing. Figure 3-4 shows an aerial view of the Philadelphia Interchange (28/351) on July 16, at 7:22 A.M. and 4:20 P.M. in 2002. Aerial photographs of each of the interchanges in the detailed study area are presented in Appendix C, Figures 36 through 53.

The photographs obviously are only one instant during each peak period so they are not meant to represent the traffic condition during the whole peak period. Actual congestion levels can vary on a day-to-day basis, and even within relatively short time periods within the peak periods.

## MITIGATING FACTORS DURING THE DATA COLLECTION

All of the collected data was reviewed for reasonableness, however, there were some mitigating factors, primarily ongoing construction programs, that likely impacted traffic conditions during the data collection period. These construction programs were identified and discussed with PTC staff before the data collection began. In general, the decision to move ahead with the data collection effort with PTC staff was based on the long-term nature of the construction projects. Many of the projects were scheduled to continue for several years, thus making the construction work a "normal" condition.

The most significant construction programs are listed below:

1. U.S. Route 202: this is a 59-mile long highway that connects Delaware to New Jersey. Part of U.S. 202 closely parallels the Turnpike from State Route 100 to State Route 23. An improvement program was underway on U.S. 202 during the data collection phase of the value pricing study. Construction activities were ongoing on U.S. 202 between North Valley Road and Gulph Road in Chester and Montgomery Counties. The construction included widening this section of U.S. 202 and improving the interchanges at I-76, U.S. 422 and Chesterbrook Boulevard. This construction activity very likely impacted traffic patterns in the vicinity, and was observed by WSA personnel to contribute to current congestion at the Valley Forge toll plaza (Interchange 24/326).


July 16, 2002 7:22 AM


July 16, 2002 4:20 PM

2. PA Route 309: There was an active program to reconstruct and improve the 10-mile expressway between Cheltenham Avenue and Welsh Road (PA Route 63) in Montgomery County. Construction activity was expected to continue within this area through approximately 2006. Work included rebuilding the four-lane roadway, reconfiguring the Fort Washington and Easton Road Interchanges, and lengthening the on and off ramps at seven additional interchanges. Traffic restrictions occurred as lanes were temporarily closed or shifted. WSA personnel observed some impacts associated at the Fort Washington toll plaza (Interchange 26/339) associated with construction activity on PA Route 309. Traffic exiting the Turnpike occasionally backed up through the toll plaza because of construction delays on PA Route 309.

3. Delaware River Memorial Bridge (I-276): A redecking effort on the Pennsylvania side of the Delaware Memorial Bridge was underway during the data collection effort. Lane closures occurred periodically during the night, and lane shifts and narrowed lanes periodically occurred during the day and night. WSA personnel noted that traffic approaching the Delaware River Bridge toll plaza (Interchange 30/359) in the westbound direction did not utilize all toll plaza lanes at times partly due to narrowed lanes and equipment adjacent to the travel lanes.

These activities probably had some impact on the traffic operating conditions on the Turnpike. Upon completion of the construction activities, traffic volumes and patterns at select locations on the Turnpike may change somewhat from what was observed and recorded by WSA personnel.

# CHAPTER 4
# VALUE PRICING OPTIONS TESTED

This chapter summarizes the process by which the initial set of value pricing scenarios was developed. The process of developing this "long list" of scenarios occurred over a period of time, and after numerous review sessions with the PTC value pricing team. Upon review of key measures, and as a result of general policy guidelines, the "long list" of value pricing options was narrowed down to the six scenarios that would be evaluated in more detail as part of the "short list" of value pricing scenarios.

## VALUE PRICING CRITERIA

Early in the study process, WSA was given several value pricing program "givens" by PTC. These included the following:

1. Value pricing based on vehicle occupancy will not be considered;
2. Value pricing will not apply to cash vehicles. Time of day pricing will apply to E-ZPass traffic only;
3. Strategies shall be evaluated separately for passenger cars and commercial vehicles. Motorcycles may be treated as a separate subset of the current passenger car class; and
4. The current commercial vehicle volume discount program is to be recognized in the evaluation of each scenario.

Taking the above into consideration, and based on WSA's background in value pricing studies, a series of scenarios were developed by varying the parameters regarding seven key variables. These included:

1. Hours of Application
   a. Two hour peak;
   b. Three hour peak;
   c. Three hour peak, with two peak and one "super peak" hour;
   d. All hours (discounts between cash and E-ZPass only without time of day variations).

2. Area of Applicability
   a. Urban areas only; and
   b. Full Turnpike.

3. Discount Method
   a. Fixed increment surcharge or discount; and
   b. Percentage based surcharge or discount.

4. Method of Time Delineation
   a. Charge based on time of entry;
   b. Charge based on time of exit; and
   c. Charge based on both time of entry and exit.

5. Days of Application
   a. Weekdays only; and
   b. Weekdays plus weekends (possibly different hours of application).

6. Vehicle Applicability
   a. Passenger cars (possibly separate for motorcycles); and
   b. Trucks

7. Amount of Toll Differential
   a. Alternative rate differentials can be analyzed for each scenario.

## DEVELOPMENT OF "LONG LIST" OF VALUE PRICING SCENARIOS

Using the above criteria, the value pricing scenarios identified in Table 4-1 were developed. The seven value pricing variables listed above form the column headings which are used to define each scenario. The reason Scenarios 1 through 7 are grouped together in the yellow box has to do with the way the toll rate differentials are defined. With these seven scenarios the peak E-ZPass rates are always equal to the cash rates (which do not vary by time of day). Only off-peak E-ZPass tolls offer a discount. The originally proposed range of toll rate differentials to test for these, and all other scenarios, is shown in Table 4-2.

The key variables that distinguish Scenarios 1 through 7 have to do with whether they are applied to the urban areas only, or to the full Turnpike. And also whether or not the discount method is a fixed dollar amount, or based on a percentage of the base toll. All assume a two hour peak period

**Table 4-1**

## Proposed "Long List" of Variable Pricing Scenarios

**Pennsylvania Turnpike Value Pricing Study**

| Scen. | Hours of Application | Area of Application | Discount Method | Time Delineation | Days of Application | Vehicle Applic. (1) | Typical Rate Differentials (2) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Cash | | | | E-Zpass | | | |
| | | | | | | | Peak | Super | Off-Peak | Night | Peak | Super | Off-Peak | Night |
| 1 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 2 | 2 per peak | Urban Areas | Percent | Exit | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 3 | 2 per peak | Full Turnpike | Fixed Increment | Exit | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 4 | 2 per peak | Full Turnpike | Percent | Exit | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 5 | 2 per peak | Urban Areas | Fixed Increment | Entry | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 6 | 2 per peak | Urban Areas | Fixed Increment | Entry or Exit | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 7 | 3 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 8 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | ++ | n/a | ++ | ++ | + | n/a | - | - |
| 9 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | ++ | n/a | ++ | ++ | + | n/a | 0 | 0 |
| 10 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | ++ | n/a | ++ | ++ | 0 | n/a | - | - |
| 11 | 2 pk/1 super pk | Preferred | Preferred | Preferred | Weekdays | All | ++ | ++ | ++ | ++ | + | ++ | - | - |
| 12 | 2 pk/1 super pk | Preferred | Preferred | Preferred | Weekdays | All | ++ | ++ | ++ | ++ | + | ++ | 0 | 0 |
| 13 | 2 pk/1 super pk | Preferred | Preferred | Preferred | Weekdays | All | ++ | ++ | ++ | ++ | 0 | ++ | - | - |
| #s 11 - 13 are only conducted if a 3-hour peak is selected. | | | | | | | | | | | | | | |
| 14 | Preferred | Preferred | Preferred | Preferred | All | All | - - - - - - - - Preferrred - - - - - - - - | | | | - - - - - - - - Preferrred - - - - - - - - | | | |
| 15 | All | Full Turnpike | (Fixed Increment) | None | All | All | + | n/a | + | + | 0 | n/a | 0 | 0 |
| 16 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | n/a | - | - | + | n/a | - | - |
| 17 | Combination flat toll differential between cash and E-Zpass all day in non-urban areas and variable pricing (based on preferred variables above) in urban areas. | | | | | | | | | | | | | |
| 18 | All | Harrisburg-Downingtown | Percent | Preferred | Weekdays | Truck | 0 | 0 | 0 | 0 | - | - | - | - |
| 19 | Provide additional motorcycle discount on final preferred scenario (E-Zpass discount only, no change to cash toll rates). | | | | | | | | | | | | | |

(1) When "All" is indicated, impacts will be estimated for cars and trucks separately.

(2) A "+" or "++" indicates a rate higher than the current toll, a "-" indicates a rate lower than the current toll, and a "0" indicates no change from the current toll.
A "+" in any row indicates the same value, thus for example, in Scenario 1 if the peak cash rate is a $1.00 surcharge, then the peak E-Zpass rate also represents a $1.00 surcharge.
A "++" is indicative of a surcharge rate higher than a "+". Thus, for example, in Scenario 12a if the peak cash surcharge is $1.00, then the peak E-Zpass surcharge may be $0.50.
In all cases, a "+", "++" and "-" represent a range of surcharges (or discounts) that will be tested, and not a single value.

**Table 4-2**

## Toll Rate Differentials Tested for the "Long List" of Value Pricing Scenarios (1)

Pennsylvania Turnpike Value Pricing Study

| Applicable Scenario | Rate | Cash Rates | | E-ZPass Rates | |
|---|---|---|---|---|---|
| | | Peak | Off-Peak | Peak | Off-Peak |
| 1, 3, 5, 6, 7 | 1 | $0.50 | $0.50 | $0.50 | -$0.50 |
| | 2 | 0.75 | 0.75 | 0.75 | 0.00 |
| | 3 | 1.00 | 1.00 | 1.00 | 0.25 |
| | 4 | 1.50 | 1.50 | 1.50 | 0.00 |
| | 5 | 1.50 | 1.50 | 1.50 | -0.50 |
| 2, 4 | 1 | 25% | 25% | 25% | -20% |
| | 2 | 50 | 50 | 50 | 0 |
| | 3 | 75 | 75 | 75 | 10 |
| | 4 | 100 | 100 | 100 | 0 |
| | 5 | 100 | 100 | 100 | -20 |
| 8 | 1 | $0.50 | $0.50 | $0.25 | -$0.50 |
| | 2 | 1.00 | 1.00 | 0.50 | -0.50 |
| | 3 | 1.50 | 1.50 | 0.75 | -0.50 |
| | 4 | 2.00 | 2.00 | 1.00 | -0.50 |
| 9 | 1 | $0.50 | $0.50 | $0.25 | $0.00 |
| | 2 | 1.00 | 1.00 | 0.50 | 0.00 |
| | 3 | 1.50 | 1.50 | 0.75 | 0.00 |
| | 4 | 2.00 | 2.00 | 1.00 | 0.00 |
| 10 | 1 | $0.50 | $0.50 | $0.00 | -$0.50 |
| | 2 | 1.00 | 1.00 | 0.00 | -0.50 |
| | 3 | 1.50 | 1.50 | 0.00 | -0.50 |
| | 4 | 2.00 | 2.00 | 0.00 | -0.50 |
| 15 | 1 | $0.50 | $0.50 | $0.00 | $0.00 |
| | 2 | 1.00 | 1.00 | 0.00 | 0.00 |
| | 3 | 1.50 | 1.50 | 0.00 | 0.00 |
| | 4 | 2.00 | 2.00 | 0.00 | 0.00 |
| 16 | 1 | $0.50 | -$0.50 | $0.50 | -$0.50 |
| | 2 | 0.75 | 0.00 | 0.75 | 0.00 |
| | 3 | 1.00 | 0.25 | 1.00 | 0.25 |
| | 4 | 1.50 | 0.00 | 1.50 | 0.00 |
| | 5 | 1.50 | -0.50 | 1.50 | -0.50 |

(1) These values represent the dollar, or percent, change from current levels.

(separately for the AM and PM peak periods), except for Scenario 7, which allows for a three hour peak. Nearly all apply the toll differential based on time of exit, except for Scenario 5 (which bases it on time of entry) and Scenario 6 (which bases it on time of entry or exit).

Value pricing Scenarios 8 through 13, all have a three tiered toll differential structure. Not only is there a difference between E-ZPass peak and off-peak rates, but there is a differential between peak period cash and E-ZPass rates. The only difference between the two hour peak Scenarios 8, 9, and 10 has to do with the relationship between peak and off-peak E-ZPass rates. The same is true for the three hour peak Scenarios 11, 12, and 13. It should be pointed out that no toll rate options are defined in Table 4-2 for Scenarios 11 through 13. This would only be done if a three hour peak scenario (i.e., Scenario 7) were selected for the "short list" of value pricing scenarios.

Scenario 14 is only shown as it represents the final preferred alternative. The final set of scenarios shown (15 through 19) either do not represent true value pricing, or represent special studies that are to be conducted as part of the overall analysis. Scenario 15 does not reflect any time of day pricing, but rather a toll differential between cash and E-ZPass rates. Scenario 16 provides for a cash time of day customers and thus violates rule #2 of the PTC "givens" above.

Scenario 17 reflects some combination of a set of preferred urban and interurban value pricing criteria (this will actually be explored in more detail in Chapter 6). And finally, Scenarios 18 and 19 reflect the two special studies described above for PA Route 41, and for motorcycle only discounts for E-ZPass users.

## DEVELOPMENT OF "SHORT LIST" OF VALUE PRICING SCENARIOS

Before discussing the development of the "short list," it should be noted that a detailed logit model was developed based on the stated preference surveys conducted as part of this study. The logit model essentially determines the shift potential (both to off-peak periods, and from cash to E-ZPass) for alternative toll rate differentials. WSA has also developed a regional Turnpike model which is used to determine, among other things, the toll sensitivity of motorists using the Turnpike. The combination of these two models allows us to measure the estimated impact (time shift, E-ZPass shift, and diversion to off-Turnpike routes) for each value pricing scenario.

This model was used to test the interchange level traffic and revenue impacts of each value pricing scenario on the "long list," as well as for each of the rate differentials shown in Table 4-2. Only a limited amount of information on this is presented in this document (see the summary Table 4-3). More detailed data will be presented in Chapter 5 as it relates to the "short list" value pricing impacts.

To help analyze all of the data developed for the "long list," a single table was developed to help compare the key characteristics of each scenario. Table 4-3 presents that information. While no absolutely common toll rate differential exists for all scenarios, WSA has attempted (as noted at the bottom of the table) to make the comparison with the rates that are most similar across scenarios. The information in Table 4-3, along with additional cost, operations and audit considerations, were used in developing the "short list" of value pricing scenarios to consider for further analysis.

Value pricing Scenarios 2 and 4 were the first to be eliminated. Both of these are based on the premise that the time of day and cash versus ETC toll differentials would be based on a "percent" of the current toll and not a "fixed" amount. These were largely eliminated for equity reasons, and because a percent based differential would tend to affect longer distance, high toll, movements much greater than the shorter distance, low toll, movements. The majority of peak period trips in the urban areas are short distance trips, most of which pay less than $1.00, with many paying only $0.50-$0.85. A fairly large toll differential of 50 percent only amounts to a peak period surcharge of $0.25-$0.45 for these trips. The peak period surcharge for a trip from New Stanton (Interchange 8) to Philadelphia (Interchange 28), on the other hand, would be an additional $5.65. The effect of this would be to only minimally affect the behavior of the majority of short distance urban trips, while penalizing longer distance trips (the majority of whose trip contributed to no urban congestion).

Scenario 5 was also eliminated from further consideration. This scenario is almost identical to value pricing Scenario 1 in that it is based on a two hour peak in the urban areas only, and based on a "fixed increment" toll differential. The only difference is that the toll differential for Scenario 5 is based on time of entry, while that for Scenario 1 is based on time of exit. Table 4-3 shows that the traffic and toll revenue impact characteristics are nearly identical between Scenarios 1 and 5. It was, therefore, determined that there was no advantage to analyzing two nearly identical scenarios.

## Table 4-3

## Comparative Summary of Results of Value Pricing "Long List"
## Average Weekday Impacts

| Value Pricing Scenario | Systemwide Revenue (1,000s) | Percent Revenue Impact | Passenger Cars Percent AM Peak Traffic Impacts Diverted | Shifted | Total | Percent AM Peak E-ZPass Share |
|---|---|---|---|---|---|---|
| Base | $1,117 | - - | - - | - - | - - | 42.9 |
| 1 | 1,328 | 18.9 | 12.6 | 7.0 | 19.6 | 41.7 |
| 2 | 1,361 | 21.8 | 9.0 | 6.6 | 15.6 | 41.6 |
| 3 | 1,464 | 31.1 | 13.2 | 7.0 | 20.2 | 41.6 |
| 4 | 1,535 | 37.4 | 9.1 | 6.6 | 15.7 | 41.1 |
| 5 | 1,334 | 19.4 | 12.4 | 6.9 | 19.3 | 41.1 |
| 6 | 1,374 | 23.0 | 11.8 | 6.9 | 18.6 | 40.3 |
| 7 | 1,341 | 20.0 | 12.8 | 5.2 | 18.0 | 42.1 |
| 8 | 1,193 | 6.8 | 9.1 | 13.2 | 22.3 | 46.6 |
| 9 | 1,281 | 14.7 | 9.6 | 6.3 | 16.0 | 48.5 |
| 10 | 1,125 | 5.2 | 6.1 | 6.7 | 12.8 | 55.5 |
| 15 | 1,355 | 21.3 | 6.6 | - - | 6.6 | 57.0 |
| 16 | 1,253 | 12.2 | 9.1 | 10.4 | 19.5 | 43.2 |

Note: For Scenarios 1-7, rate level 3 is shown.
For Scenarios 8, 9, and 10, rate level 2 is shown.
For Scenario 15, rate level 2 is shown.
For Scenario 16, rate level 2 is shown.

Value pricing Scenario 6, however, was included in the "short list"; this too is very similar to Scenarios 1 and 5, but the value pricing is based on time of exit or entry. This scenario generates slightly more toll revenue and less toll diversion than the exit only based condition; it also allows for consideration of at least one scenario where time of entry is taken into account. The real benefits of an exit only versus exit plus entry based value pricing scenario will be borne out more clearly in a plaza level comparison rather than at a global level.

Value pricing Scenario 7 was the only condition studied at this time that included a three hour peak period. This was eliminated for several reasons. On a percent basis, it has the lowest time shift effect of all scenarios tested. As shown in Table 4-3, only about 5.2 percent of traffic is estimated to shift out of the AM peak period. This occurs because the highest volume time periods have to shift the greatest amount of time. To shift out of a two hour peak, the maximum amount of time required to shift is one hour; with a three hour peak the maximum increases to one and a half hours. Those in the middle of the peak are typically the group you most want to shift to an off peak period, and a three hour peak condition would impact them the least. Also, the three hour period extends into time periods where there is really no need to reduce congestion. Thus, you are unduly penalizing those who are not greatly contributing to congestion.

While WSA did not analyze value pricing Scenarios 11 through 13 at this time, they all include some variation of a three hour peak period. Thus, because we have eliminated Scenario 7 from the "short list," it will not be necessary to test the impacts of value pricing Scenarios 11 through 13.

Value pricing Scenarios 8, 9 and 10 are really variations on the same concept, but using different toll differential combinations. In each case, unlike all previous scenarios tested, the cash rates (which are the same all day long) are always higher than the peak period E-ZPass rate. The primary difference between Scenarios 8 through 10 is how the E-ZPass off-peak toll differentials are developed. In Scenarios 8 and 10, the off-peak ETC rates are assumed to be lower than current levels. As a result, as shown in Table 4-3, these two scenarios result in the two lowest revenue impacts of all scenarios tested. Because it may be necessary at some point in the future to raise rates on the Turnpike, it was deemed unhelpful to set a precedent of reducing rates. As a result, both Scenarios 8 and 10 were eliminated from the "short list." Scenario 9 retains the concept of a higher cash toll compared to peak ETC rates, but maintains off-peak ETC rates at current levels. Scenario 9 was included in the short list.

Scenario 15 assumes a toll differential between cash and ETC. No time of day pricing is involved. This scenario was included in the short list because it represents the minimum strategy that the PTC could employ to improve Turnpike operations.

The final value pricing scenario tested was Scenario 16. This includes time of day toll differential for both cash and ETC motorists. As shown in Table 4-3, this has the third worst revenue impact (after Scenarios 8 and 10). It also provides smaller total peak period traffic impacts than Scenarios 1 and 3. PTC has also analyzed the technical implications of implementing cash based time of day pricing and concluded that it would be very difficult, if not impossible, under current conditions. The summary document from PTC ("Value Pricing, Justification for the Elimination of the Cash VP Alternatives") is included in the appendix to this report.

Table 4-4 provides a revised summary of the "short list" of VP scenarios to test. For ease of comparison, we have maintained the numbering system developed in Table 4-1 for the "long list" of initial value pricing scenarios. Note here, however, the addition of Scenario 20, which was not previously included in the "long list." This scenario is nearly identical to Scenario 15, but provides for the cash versus ETC differential to be based on a percentage basis, rather than a fixed toll basis. The addition of this scenario was suggested by PTC.

Finally, in Table 4-5 a rather wide range of toll rate differentials were tested. Toll differentials tested ranged from a low of $0.25 to a high of $2.50. It was determined that relatively little shifting occurs at the low end, and too much shifting occurs at the high end. By too much, we mean that the resulting shift of traffic from the peak to shoulder periods resulted in the shoulder periods having more traffic than that originally in the peak. WSA agreed to fine tune the rate differentials to test such that they are closer to the middle set of rates shown in Table 4-2. Table 4-5 provides a summary of the revised rates WSA tested on the "short list" of value pricing scenarios.

**Table 4-4**
## Summary of "Short List" of Value Pricing Scenarios
**Pennsylvania Turnpike Value Pricing Study**

| Scen. | Hours of Application | Area of Application | Discount Method | Time Delineation | Days of Application | Vehicle Applic. (1) | Typical Rate Differentials (2) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Cash | | | | E-Zpass | | | |
| | | | | | | | Peak | Super | Off-Peak | Night | Peak | Super | Off-Peak | Night |
| 1 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 3 | 2 per peak | Full Turnpike | Fixed Increment | Exit | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 6 | 2 per peak | Urban Areas | Fixed Increment | Entry or Exit | Weekdays | All | + | n/a | + | + | + | n/a | - | - |
| 9 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | ++ | n/a | ++ | ++ | + | n/a | 0 | 0 |
| 15 | All | Full Turnpike | Fixed Increment | None | All | All | + | n/a | + | + | 0 | n/a | 0 | 0 |
| 20 | All | Full Turnpike | Percent Increment | None | All | All | + | n/a | + | + | 0 | n/a | 0 | 0 |
| 17 | Combination flat toll differential between cash and E-Zpass all day in non-urban areas and variable pricing (based on preferred variables above) in urban areas. | | | | | | | | | | | | | |
| 18 | All | Harrisburg-Downingtown | Percent | Preferred | Weekdays | Truck | 0 | 0 | 0 | 0 | - | - | - | - |
| 19 | Provide additional motorcycle discount on final preferred scenario (E-Zpass discount only, no change to cash toll rates). | | | | | | | | | | | | | |
| 14 | Preferred | Preferred | Preferred | Preferred | Preferred | Preferred | - - - - - - - - Preferrred - - - - - - - - | | | | - - - - - - - - Preferrred - - - - - - - - | | | |

(1) When "All" is indicated, impacts will be estimated for cars and trucks separately.
(2) A "+" or "++" indicates a rate higher than the current toll, a "-" indicates a rate lower than the current toll, and a "0" indicates no change from the current toll.
A "+" in any row indicates the same value, thus for example, in Scenario 1 if the peak cash rate is a $1.00 surcharge, then the peak E-Zpass rate also represents a $1.00 surcharge.
A "++" is indicative of a surcharge rate higher than a "+". Thus, for example, in Scenario 9 if the peak cash surcharge is $1.00, then the peak E-ZPass surcharge may be $0.50.
In all cases, a "+", "++" and "-" represent a range of surcharges (or discounts) that will be tested, and not a single value.

**Table 4-5**

## Toll Rate Differentials Tested for the "Short List" of Value Pricing Scenarios (1)

Pennsylvania Turnpike Value Pricing Study

| Applicable Scenario | Rate | Cash Rates | | E-ZPass Rates | |
|---|---|---|---|---|---|
| | | Peak | Off-Peak | Peak | Off-Peak |
| 1, 3, 6 | 1 | $0.75 | $0.75 | $0.75 | $0.00 |
| | 2 | 0.75 | 0.75 | 0.75 | 0.25 |
| | 3 | 1.00 | 1.00 | 1.00 | 0.00 |
| | 4 | 1.00 | 1.00 | 1.00 | 0.25 |
| 9 | 1 | $0.75 | $0.75 | $0.50 | $0.00 |
| | 2 | 1.00 | 1.00 | 0.75 | 0.00 |
| | 3 | 1.25 | 1.25 | 0.50 | 0.00 |
| | 4 | 1.50 | 1.50 | 0.75 | 0.00 |
| 15 | 1 | $0.75 | $0.75 | $0.00 | $0.00 |
| | 2 | 1.00 | 1.00 | 0.00 | 0.00 |
| | 3 | 1.25 | 1.25 | 0.00 | 0.00 |
| | 4 | 1.50 | 1.50 | 0.00 | 0.00 |
| 20 | 1 | 5% | 5% | 0% | 0% |
| | 2 | 10 | 10 | 0 | 0 |
| | 3 | 20 | 20 | 0 | 0 |
| | 4 | 30 | 30 | 0 | 0 |

(1) These values represent the dollar, or percent, change from current levels.

# CHAPTER 5

# VALUE PRICING SHORT LIST IMPACT ANALYSIS

In Chapter 4 the "short list" of value pricing scenarios, and a refined set of toll rate differentials were defined. The traffic and toll revenue impacts of each will be discussed in this chapter. In all cases, when traffic impacts are being discussed, only the Pittsburgh and Philadelphia area interchanges will be discussed, even though in some cases, such as value pricing Scenario 3, the impacts actually extend to the entire Ticket System. The model is actually calculating impacts at all interchanges, but for purposes of discussing traffic impacts it is really only relevant to refer to impacts in the congested urban areas.

However, when toll revenue impacts are being described, impacts will be identified for the two urban areas as well as the non-urban areas. Revenue impacts in the non-urban areas can be substantial and need to be factored into any analysis of the relative benefits of one scenario (or rate differential) over another.

## ESTIMATED TRAFFIC IMPACTS

All impacts developed as part of this analysis are analyzed on a period by period basis (AM, PM, off-Peak), by vehicle class, by market category (cash versus E-ZPass) and by interchange. Summary tables of these were developed but are too cumbersome to provide in the main body of the report. Here, impacts will be summarized by urban area and for cars versus trucks. Detailed information at the interchange level is provided in Appendices Tables 1-48 for 2002 level analyses, and in Appendices Tables 49-96 for 2012 level analyses.

Tables 5-1 through 5-6 identify the percent AM and PM peak period daily traffic impacts (at 2002 levels) for value pricing Scenarios 1, 3, 6, 9, 15, and 20. For ease of use, the value pricing criteria are shown in the upper left hand corner of each table, and the four toll rate differentials tested are provided in the upper right hand corner.

As shown, these tables break out the net peak period traffic impacts (i.e., percent reduction in peak period traffic) into the component that was diverted (left the Turnpike to use an alternative route) and the component that was shifted to an off-peak time period.

Urban area impacts are identical between Scenarios 1 and 3 since the rate differentials tested are identical between the two. The only difference is that value pricing also extends to the non urban areas in value pricing Scenario 3. Scenario 6 also has the same rate differentials, but its value pricing application is based on both time of exit and time of entry. Even so, the percent impacts are very similar to those for Scenarios 1 and 3.

The percent impacts change measurably with value pricing Scenario 9 due to the alternative rate differentials being tested. Generally speaking, the higher the absolute rate increase, the higher diversion levels will be expected. And the greater the toll differential between E-ZPass off-peak rates and peak E-ZPass or cash rates, the greater the shift impact.

Both of these conditions converge in Scenario 9 Rate 4 (Table 5-4). There is no off-peak E-ZPass rate increase, but a $1.50 cash increase and $0.75 peak E-ZPass increase. As shown, car diversion levels amount to 13.1 percent in the AM period and 13.6 percent in the PM period. But because the rate differential between E-ZPass off-peak and the cash rates is so high, it also offers the greatest motivation for time shift. In this case, there is a 10.1 percent AM period shift and a 9.1 percent PM shift.

Value pricing Scenario 15 offers no time of day pricing, only discount for using E-ZPass. As such, there are only diversion impacts under this scenario (see Table 5-5). As would be expected, the greatest diversion impacts occur at the highest rate differential (Rate 4).

Finally, Scenario 20 is similar to Scenario 15 in that no time of day pricing is offered. Table 5-6 shows that, here too, there is no time shift impact, but only a diversion impact. Because the majority of trips in the urban area are short distance trips, however, the application of a percent based rate increase results in relatively low rate increases, and therefore, relatively low diversion impacts. Total diversion impacts amount to less than 2 percent, even at the highest 30 percent rate differential tested.

Tables 5-7 through 5-12 provide the same information, but at estimated 2012 levels. The same general patterns exist between scenarios, but the overall impacts tend to be somewhat less in 2012 compared to 2002. This is because, while the shift impacts are similar, the diversion impacts are much less in 2012 compared to 2002. This is to be expected since the

impact of increasing values of time would tend to reduce the reaction (i.e., diversion) of motorists to higher tolls in the future.

There is another interesting characteristic in these data. The percent impacts are nearly identical in all scenarios between the two urban areas.

## ESTIMATED REVENUE IMPACTS

Tables 5-13 through 5-18 provide a summary of the estimated revenue impacts associated with each of the same value pricing scenarios. As can be seen, not only are Pittsburgh and Philadelphia shown, but also the non urban areas as well. As indicated above, it is important to take into account total revenue impacts when comparing the scenarios against one another.

As with the traffic impact analysis, Scenarios 1 and 3 are identical in the two urban areas. But, the addition of non urban revenue in Scenario 3 adds substantially to the overall revenue impact. In fact, the combination of peak and off-peak rate increases results in non urban revenue impacts greater than those for the Pittsburgh area.

Also unlike the traffic impacts, Scenario 6 is now much greater than Scenario 1. At the highest overall rate levels (Rate 4) the total Scenario impact amounts to 18.9 percent, while that for Scenario 6 increases revenue by an estimated 23.0 percent. The combination of value pricing being based on entry and exit adds between 3 and 4 percent to the estimated revenue impact.

Scenario 9 has a revenue impact almost identical to that for Scenario 1. Scenario 15 revenue impacts also include the added revenue from the non urban portion of the system. Thus, it exhibits significantly higher revenue compared to Scenarios 1, 6 and 9, but less than Scenario 3. Even though cash tolls are higher for Scenario 15 (at Rates 2-4), they do not make up for the lower E-ZPass rates (which allow for no increase).

Scenario 20 toll revenue impacts show similar patterns to the traffic impacts. The relatively low percent rate increases result in low revenue impacts. Between Rates 1 and 4, toll revenue only increases from about 2 to 13 percent.

Tables 5-19 through 5-24 provide the same revenue impact information at estimated 2012 levels. The same trends hold between scenarios, but the 2012 level impacts are generally slightly greater (on a percent basis) compared to those in 2002.

## GRAPHICAL COMPARISON OF SCENARIOS 1 AND 9

Finally, a graphical representation of the value pricing impacts can be seen in Figures 5-1 through 5-7. These figures show AM period volumes in 15-minute segments for each of the four rates selected for the "short list" of value pricing scenarios. For comparative purposes, 2002 level impacts are shown in the left most figures on each page, and estimated 2012 volumes are represented in the right most figures. Only a select number of the higher volume interchanges is shown here, but a full set of tables and figures is shown in the Appendix (Tables 97-130 and Figures 1-34) which show all study area interchanges, and both the AM and PM periods.

Each individual figure shows the estimated existing condition volumes (the black line), value pricing Scenario 1 volumes, and value pricing Scenario 9 volumes. Scenarios 1 and 9 are really representative of the types of value pricing impacts for most scenarios tested. For example, Scenarios 1, 3, and 6 all have the same value pricing rate differentials. Scenarios 15 and 20 are not represented because they offer no time of day pricing differentials (only an E-ZPass discount), and do not result in any time shift. Since the purpose of these figures is to visually show the effect of the shift to off-peak periods Scenarios 15 and 20 are not included.

As indicated above, the black line represents current toll rate conditions. The grey box of each graph represents the typical systemwide peak two hour peak period. The goal of value pricing is to reduce volumes during this period, but not to the detriment of the non-value pricing shoulder hours just before, and just after, the value pricing period.

At Interchange 24 (Figure 5-2), for example, the traffic volume reduction during the peak period is evident as both the Scenario 1 and 9 (green and red lines) traffic volumes dip below the existing condition volumes. The impact of Scenarios 1 and 9 is similar at Rate 1 levels, with Scenario 9 volumes slightly less at Rate 2 levels. This is reversed when Rate 3 is assumed; Scenario 1 volumes are slightly less than Scenario 9. At Rate 4, the impacts are again very similar. In general, these trends hold at most interchanges.

The final key characteristic to note is the impact on the shoulder hours of each peak period. In Figure 5-2 you can see a sharp increase in volumes for Scenarios 1 and 9 immediately before and after the peak value pricing period. This represents the volume that has shifted from the peak to the off-peak period. Most people will shift the minimum amount of time necessary in order to avoid the value pricing peak period.

These shoulder peaking characteristics are typically quite short, but can be dramatic, and in some cases higher than peak volumes under the current tolling structure. At Interchange 25, this does not occur. The estimated shoulder peaks generated by Scenarios 1 and 9 never surpass existing condition peaks.

The situation can be quite different, however, as shown at Interchange 27 (Figure 5-6). Here the post peak shoulder volumes do exceed, for a very brief time period and for certain Rates, the current peak volumes. At Rate 1, both Scenario 1 and 9 volumes equal the existing peak volumes. At Rate 2, however, Scenario 1 volumes drop below existing peaks, while Scenario 9 volumes begin to exceed existing condition peaks. And, as shown at Interchange 24, this trend reverses with Rate 3.

In all cases, volumes are reduced by value pricing during the value pricing period. This is the result of both traffic diversion to alternative routes and traffic shifting to off-peak periods. But, as shown above, it is also important to consider the potential impact on shoulder periods (among other issues, such as revenue impacts) when considering value pricing for implementation.

# Table 5-1
## Estimated 2002 Peak Period Traffic Impacts of Value Pricing
## Scenario 1

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixed | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -10.6 | -7.0 | -5.0 | -14.0 | -15.5 | -21.0 | -9.5 | -7.0 | -3.9 | -14.1 | -13.4 | -21.1 |
| Rate 2 | -10.8 | -7.2 | -3.2 | -11.3 | -14.0 | -18.5 | -9.6 | -7.2 | -2.6 | -10.5 | -12.1 | -17.7 |
| Rate 3 | -13.7 | -8.2 | -6.8 | -16.4 | -20.5 | -24.6 | -12.5 | -8.6 | -5.4 | -16.9 | -17.9 | -25.5 |
| Rate 4 | -14.0 | -8.3 | -5.0 | -14.0 | -18.9 | -22.3 | -12.7 | -8.8 | -3.9 | -14.1 | -16.7 | -22.9 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -9.2 | -8.1 | -7.4 | -13.4 | -16.6 | -21.5 | -8.6 | -8.8 | -7.3 | -13.5 | -15.9 | -22.4 |
| Rate 2 | -9.5 | -8.5 | -4.8 | -10.6 | -14.3 | -19.1 | -8.8 | -9.2 | -4.8 | -10.9 | -13.6 | -20.1 |
| Rate 3 | -12.0 | -10.2 | -10.0 | -15.9 | -22.0 | -26.1 | -11.1 | -11.3 | -10.0 | -16.0 | -21.1 | -27.3 |
| Rate 4 | -12.3 | -10.5 | -7.4 | -13.4 | -19.7 | -24.0 | -11.4 | -11.7 | -7.3 | -13.5 | -18.8 | -25.2 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -9.4 | -7.9 | -7.0 | -13.6 | -16.4 | -21.4 | -8.8 | -8.3 | -6.6 | -13.7 | -15.4 | -22.0 |
| Rate 2 | -9.7 | -8.2 | -4.5 | -10.8 | -14.2 | -19.0 | -9.0 | -8.6 | -4.3 | -10.8 | -13.3 | -19.4 |
| Rate 3 | -12.3 | -9.7 | -9.5 | -16.0 | -21.7 | -25.7 | -11.4 | -10.5 | -9.0 | -16.2 | -20.4 | -26.8 |
| Rate 4 | -12.6 | -10.0 | -7.0 | -13.6 | -19.6 | -23.6 | -11.7 | -10.8 | -6.6 | -13.7 | -18.3 | -24.5 |

# Table 5-2
## Estimated 2002 Peak Period Traffic Impacts of Value Pricing
## Scenario 3

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixed | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -10.6 | -7.0 | -5.0 | -14.0 | -15.5 | -21.0 | -9.5 | -7.0 | -3.9 | -14.1 | -13.4 | -21.1 |
| Rate 2 | -10.8 | -7.2 | -3.2 | -11.3 | -14.0 | -18.5 | -9.6 | -7.2 | -2.6 | -10.5 | -12.1 | -17.7 |
| Rate 3 | -13.7 | -8.2 | -6.8 | -16.4 | -20.5 | -24.6 | -12.5 | -8.6 | -5.4 | -16.9 | -17.9 | -25.5 |
| Rate 4 | -14.0 | -8.3 | -5.0 | -14.0 | -18.9 | -22.3 | -12.7 | -8.8 | -3.9 | -14.1 | -16.7 | -22.9 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -9.2 | -8.1 | -7.4 | -13.4 | -16.6 | -21.5 | -8.6 | -8.8 | -7.3 | -13.5 | -15.9 | -22.4 |
| Rate 2 | -9.5 | -8.5 | -4.8 | -10.6 | -14.3 | -19.1 | -8.8 | -9.2 | -4.8 | -10.9 | -13.6 | -20.1 |
| Rate 3 | -12.0 | -10.2 | -10.0 | -15.9 | -22.0 | -26.1 | -11.1 | -11.3 | -10.0 | -16.0 | -21.1 | -27.3 |
| Rate 4 | -12.3 | -10.5 | -7.4 | -13.4 | -19.7 | -24.0 | -11.4 | -11.7 | -7.3 | -13.5 | -18.8 | -25.2 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -9.4 | -7.9 | -7.0 | -13.6 | -16.4 | -21.4 | -8.8 | -8.3 | -6.6 | -13.7 | -15.4 | -22.0 |
| Rate 2 | -9.7 | -8.2 | -4.5 | -10.8 | -14.2 | -19.0 | -9.0 | -8.6 | -4.3 | -10.8 | -13.3 | -19.4 |
| Rate 3 | -12.3 | -9.7 | -9.5 | -16.0 | -21.7 | -25.7 | -11.4 | -10.5 | -9.0 | -16.2 | -20.4 | -26.8 |
| Rate 4 | -12.6 | -10.0 | -7.0 | -13.6 | -19.6 | -23.6 | -11.7 | -10.8 | -6.6 | -13.7 | -18.3 | -24.5 |

# Table 5-3
# Estimated 2002 Peak Period Traffic Impacts of Value Pricing
# Scenario 6

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixed | Both |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -9.4 | -5.6 | -4.8 | -14.0 | -14.3 | -19.6 | -8.5 | -5.5 | -3.8 | -13.6 | -12.3 | -19.1 |
| Rate 2 | -9.6 | -5.8 | -3.1 | -11.0 | -12.7 | -16.8 | -8.5 | -5.6 | -2.5 | -10.3 | -11.0 | -15.9 |
| Rate 3 | -12.2 | -6.6 | -6.6 | -16.3 | -18.8 | -22.9 | -11.1 | -6.7 | -5.3 | -16.5 | -16.4 | -23.2 |
| Rate 4 | -12.5 | -6.7 | -4.8 | -14.0 | -17.3 | -20.6 | -11.3 | -6.8 | -3.8 | -13.6 | -15.1 | -20.4 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -8.7 | -7.5 | -7.4 | -13.1 | -16.0 | -20.6 | -8.4 | -7.9 | -7.3 | -13.0 | -15.7 | -20.9 |
| Rate 2 | -8.9 | -7.9 | -4.8 | -10.2 | -13.7 | -18.1 | -8.6 | -8.2 | -4.8 | -10.2 | -13.4 | -18.4 |
| Rate 3 | -11.3 | -9.6 | -10.0 | -15.7 | -21.2 | -25.2 | -10.8 | -10.1 | -10.0 | -15.5 | -20.8 | -25.6 |
| Rate 4 | -11.6 | -10.0 | -7.4 | -13.1 | -19.0 | -23.0 | -11.1 | -10.5 | -7.3 | -13.0 | -18.4 | -23.5 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -8.8 | -7.0 | -6.9 | -13.3 | -15.7 | -20.3 | -8.4 | -7.1 | -6.5 | -13.2 | -14.9 | -20.3 |
| Rate 2 | -9.0 | -7.4 | -4.5 | -10.4 | -13.5 | -17.8 | -8.6 | -7.4 | -4.3 | -10.3 | -12.8 | -17.7 |
| Rate 3 | -11.4 | -8.8 | -9.3 | -15.8 | -20.8 | -24.6 | -10.9 | -9.0 | -8.9 | -15.8 | -19.7 | -24.8 |
| Rate 4 | -11.8 | -9.1 | -6.9 | -13.3 | -18.6 | -22.4 | -11.1 | -9.4 | -6.5 | -13.2 | -17.6 | -22.5 |

# Table 5-4
# Estimated 2002 Peak Period Traffic Impacts of Value Pricing
# Scenario 9

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixed | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.50 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.00 | 1.00 | 1.00 |
| Rate 3 | 0.50 | 0.00 | 1.25 | 1.25 |
| Rate 4 | 0.75 | 0.00 | 1.50 | 1.50 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -9.5 | -5.5 | -4.0 | -11.8 | -13.6 | -17.3 | -8.8 | -5.4 | -3.0 | -11.9 | -11.8 | -17.3 |
| Rate 2 | -12.7 | -7.6 | -6.2 | -14.4 | -18.9 | -22.0 | -12.0 | -8.0 | -4.5 | -14.8 | -16.6 | -22.8 |
| Rate 3 | -13.9 | -6.7 | -4.3 | -13.1 | -18.2 | -19.8 | -13.5 | -6.4 | -3.2 | -12.9 | -16.7 | -19.4 |
| Rate 4 | -17.1 | -9.0 | -6.7 | -15.8 | -23.8 | -24.7 | -16.5 | -8.5 | -5.0 | -15.8 | -21.5 | -24.3 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -7.8 | -6.6 | -6.6 | -11.4 | -14.4 | -18.1 | -7.4 | -7.3 | -6.3 | -11.6 | -13.7 | -18.9 |
| Rate 2 | -10.6 | -9.1 | -9.8 | -14.1 | -20.4 | -23.1 | -10.0 | -10.0 | -9.5 | -14.2 | -19.6 | -24.2 |
| Rate 3 | -10.5 | -8.5 | -7.0 | -12.9 | -17.5 | -21.4 | -10.3 | -9.5 | -6.7 | -13.0 | -17.0 | -22.5 |
| Rate 4 | -13.1 | -11.1 | -10.8 | -15.6 | -23.9 | -26.6 | -12.8 | -12.3 | -10.3 | -15.5 | -23.0 | -27.8 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -8.1 | -6.4 | -6.2 | -11.5 | -14.2 | -17.9 | -7.7 | -6.7 | -5.6 | -11.7 | -13.3 | -18.4 |
| Rate 2 | -11.0 | -8.7 | -9.2 | -14.2 | -20.1 | -22.9 | -10.5 | -9.4 | -8.5 | -14.4 | -18.9 | -23.8 |
| Rate 3 | -11.1 | -8.1 | -6.5 | -12.9 | -17.6 | -21.0 | -11.0 | -8.6 | -6.0 | -13.0 | -16.9 | -21.6 |
| Rate 4 | -13.8 | -10.6 | -10.1 | -15.6 | -23.9 | -26.2 | -13.6 | -11.2 | -9.1 | -15.6 | -22.7 | -26.8 |

# Table 5-5
# Estimated 2002 Peak Period Traffic Impacts of Value Pricing
# Scenario 15

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixed | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.00 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.00 | 0.00 | 1.00 | 1.00 |
| Rate 3 | 0.00 | 0.00 | 1.25 | 1.25 |
| Rate 4 | 0.00 | 0.00 | 1.50 | 1.50 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -7.3 | -3.1 | 0.0 | 0.0 | -7.3 | -3.1 | -7.4 | -3.4 | 0.0 | 0.0 | -7.4 | -3.4 |
| Rate 2 | -9.3 | -3.8 | 0.0 | 0.0 | -9.3 | -3.8 | -9.8 | -4.0 | 0.0 | 0.0 | -9.8 | -4.0 |
| Rate 3 | -11.1 | -4.8 | 0.0 | 0.0 | -11.1 | -4.8 | -11.5 | -4.3 | 0.0 | 0.0 | -11.5 | -4.3 |
| Rate 4 | -12.7 | -5.5 | 0.0 | 0.0 | -12.7 | -5.5 | -13.6 | -5.3 | 0.0 | 0.0 | -13.6 | -5.3 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -4.6 | -4.0 | 0.0 | 0.0 | -4.6 | -4.0 | -4.7 | -4.3 | 0.0 | 0.0 | -4.7 | -4.3 |
| Rate 2 | -5.7 | -5.2 | 0.0 | 0.0 | -5.7 | -5.2 | -6.0 | -5.6 | 0.0 | 0.0 | -6.0 | -5.6 |
| Rate 3 | -6.7 | -6.4 | 0.0 | 0.0 | -6.7 | -6.4 | -7.0 | -6.7 | 0.0 | 0.0 | -7.0 | -6.7 |
| Rate 4 | -7.6 | -7.6 | 0.0 | 0.0 | -7.6 | -7.6 | -8.0 | -8.5 | 0.0 | 0.0 | -8.0 | -8.5 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -5.0 | -3.8 | 0.0 | 0.0 | -5.0 | -3.8 | -5.3 | -4.1 | 0.0 | 0.0 | -5.3 | -4.1 |
| Rate 2 | -6.4 | -4.9 | 0.0 | 0.0 | -6.4 | -4.9 | -6.8 | -5.2 | 0.0 | 0.0 | -6.8 | -5.2 |
| Rate 3 | -7.5 | -6.0 | 0.0 | 0.0 | -7.5 | -6.0 | -8.0 | -6.0 | 0.0 | 0.0 | -8.0 | -6.0 |
| Rate 4 | -8.5 | -7.1 | 0.0 | 0.0 | -8.5 | -7.1 | -9.2 | -7.6 | 0.0 | 0.0 | -9.2 | -7.6 |

# Table 5-6
## Estimated 2002 Peak Period Traffic Impacts of Value Pricing
## Scenario 20

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Percent | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | 0.0% | 0.0% | 5.0% | 5.0% |
| Rate 2 | 0.0 | 0.0 | 10.0 | 10.0 |
| Rate 3 | 0.0 | 0.0 | 20.0 | 20.0 |
| Rate 4 | 0.0 | 0.0 | 30.0 | 30.0 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -0.4 | 0.0 | 0.0 | 0.0 | -0.4 | 0.0 | -0.7 | 0.0 | 0.0 | 0.0 | -0.7 | 0.0 |
| Rate 2 | -0.9 | 0.0 | 0.0 | 0.0 | -0.9 | 0.0 | -1.0 | 0.0 | 0.0 | 0.0 | -1.0 | 0.0 |
| Rate 3 | -1.7 | -0.7 | 0.0 | 0.0 | -1.7 | -0.7 | -1.9 | -0.7 | 0.0 | 0.0 | -1.9 | -0.7 |
| Rate 4 | -2.5 | -1.3 | 0.0 | 0.0 | -2.5 | -1.3 | -3.0 | -1.1 | 0.0 | 0.0 | -3.0 | -1.1 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -0.4 | 0.0 | 0.0 | 0.0 | -0.4 | 0.0 | -0.5 | 0.0 | 0.0 | 0.0 | -0.5 | 0.0 |
| Rate 2 | -0.7 | -0.4 | 0.0 | 0.0 | -0.7 | -0.4 | -0.8 | -0.3 | 0.0 | 0.0 | -0.8 | -0.3 |
| Rate 3 | -1.3 | -1.2 | 0.0 | 0.0 | -1.3 | -1.2 | -1.4 | -1.5 | 0.0 | 0.0 | -1.4 | -1.5 |
| Rate 4 | -2.0 | -1.8 | 0.0 | 0.0 | -2.0 | -1.8 | -2.1 | -2.2 | 0.0 | 0.0 | -2.1 | -2.2 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -0.4 | 0.0 | 0.0 | 0.0 | -0.4 | 0.0 | -0.5 | 0.0 | 0.0 | 0.0 | -0.5 | 0.0 |
| Rate 2 | -0.7 | -0.3 | 0.0 | 0.0 | -0.7 | -0.3 | -0.8 | -0.2 | 0.0 | 0.0 | -0.8 | -0.2 |
| Rate 3 | -1.3 | -1.1 | 0.0 | 0.0 | -1.3 | -1.1 | -1.5 | -1.3 | 0.0 | 0.0 | -1.5 | -1.3 |
| Rate 4 | -2.1 | -1.7 | 0.0 | 0.0 | -2.1 | -1.7 | -2.3 | -1.9 | 0.0 | 0.0 | -2.3 | -1.9 |

# Table 5-7
## Estimated 2012 Peak Period Traffic Impacts of Value Pricing
## Scenario 1

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixed | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -7.8 | -5.8 | -5.4 | -13.9 | -13.2 | -19.7 | -6.9 | -5.8 | -4.4 | -14.0 | -11.4 | -19.8 |
| Rate 2 | -7.9 | -5.9 | -3.6 | -11.1 | -11.5 | -17.0 | -7.1 | -5.9 | -2.9 | -11.2 | -10.0 | -17.1 |
| Rate 3 | -10.6 | -6.9 | -7.5 | -16.3 | -18.1 | -23.2 | -9.8 | -6.8 | -6.1 | -16.7 | -15.8 | -23.5 |
| Rate 4 | -10.8 | -7.3 | -5.4 | -13.9 | -16.2 | -21.2 | -9.9 | -7.1 | -4.4 | -14.0 | -14.4 | -21.1 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -6.8 | -7.0 | -7.9 | -13.4 | -14.7 | -20.4 | -6.3 | -7.7 | -8.1 | -13.5 | -14.4 | -21.2 |
| Rate 2 | -7.0 | -7.1 | -5.2 | -10.7 | -12.2 | -17.8 | -6.5 | -8.0 | -5.3 | -10.6 | -11.8 | -18.6 |
| Rate 3 | -9.3 | -8.9 | -10.7 | -15.9 | -20.0 | -24.8 | -8.6 | -9.9 | -11.0 | -16.0 | -19.6 | -25.9 |
| Rate 4 | -9.6 | -9.3 | -7.9 | -13.4 | -17.5 | -22.7 | -8.9 | -10.3 | -8.1 | -13.5 | -17.0 | -23.7 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -6.9 | -6.7 | -7.5 | -13.5 | -14.4 | -20.2 | -6.5 | -7.2 | -7.3 | -13.6 | -13.8 | -20.8 |
| Rate 2 | -7.1 | -6.9 | -4.9 | -10.8 | -12.0 | -17.6 | -6.6 | -7.4 | -4.8 | -10.8 | -11.5 | -18.2 |
| Rate 3 | -9.5 | -8.5 | -10.2 | -16.0 | -19.7 | -24.4 | -8.9 | -9.0 | -10.0 | -16.2 | -18.8 | -25.2 |
| Rate 4 | -9.8 | -8.8 | -7.5 | -13.5 | -17.3 | -22.3 | -9.1 | -9.3 | -7.3 | -13.6 | -16.5 | -23.0 |

# Table 5-8
# Estimated 2012 Peak Period Traffic Impacts of Value Pricing
# Scenario 3

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixed | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -7.8 | -5.8 | -5.4 | -13.9 | -13.2 | -19.7 | -6.9 | -5.8 | -4.4 | -14.0 | -11.4 | -19.8 |
| Rate 2 | -7.9 | -5.9 | -3.6 | -11.1 | -11.5 | -17.0 | -7.1 | -5.9 | -2.9 | -11.2 | -10.0 | -17.1 |
| Rate 3 | -10.6 | -6.9 | -7.5 | -16.3 | -18.1 | -23.2 | -9.8 | -6.8 | -6.1 | -16.7 | -15.8 | -23.5 |
| Rate 4 | -10.8 | -7.3 | -5.4 | -13.9 | -16.2 | -21.2 | -9.9 | -7.1 | -4.4 | -14.0 | -14.4 | -21.1 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -6.8 | -7.0 | -7.9 | -13.4 | -14.7 | -20.4 | -6.3 | -7.7 | -8.1 | -13.5 | -14.4 | -21.2 |
| Rate 2 | -7.0 | -7.1 | -5.2 | -10.7 | -12.2 | -17.8 | -6.5 | -8.0 | -5.3 | -10.6 | -11.8 | -18.6 |
| Rate 3 | -9.3 | -8.9 | -10.7 | -15.9 | -20.0 | -24.8 | -8.6 | -9.9 | -11.0 | -16.0 | -19.6 | -25.9 |
| Rate 4 | -9.6 | -9.3 | -7.9 | -13.4 | -17.5 | -22.7 | -8.9 | -10.3 | -8.1 | -13.5 | -17.0 | -23.7 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -6.9 | -6.7 | -7.5 | -13.5 | -14.4 | -20.2 | -6.5 | -7.2 | -7.3 | -13.6 | -13.8 | -20.8 |
| Rate 2 | -7.1 | -6.9 | -4.9 | -10.8 | -12.0 | -17.6 | -6.6 | -7.4 | -4.8 | -10.8 | -11.5 | -18.2 |
| Rate 3 | -9.5 | -8.5 | -10.2 | -16.0 | -19.7 | -24.4 | -8.9 | -9.0 | -10.0 | -16.2 | -18.8 | -25.2 |
| Rate 4 | -9.8 | -8.8 | -7.5 | -13.5 | -17.3 | -22.3 | -9.1 | -9.3 | -7.3 | -13.6 | -16.5 | -23.0 |

# Table 5-9
# Estimated 2012 Peak Period Traffic Impacts of Value Pricing
# Scenario 6

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixed | Both |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -7.0 | -4.7 | -5.3 | -13.6 | -12.2 | -18.3 | -6.2 | -4.5 | -4.3 | -13.6 | -10.5 | -18.1 |
| Rate 2 | -7.1 | -4.9 | -3.5 | -11.1 | -10.6 | -16.0 | -6.3 | -4.6 | -2.8 | -10.9 | -9.1 | -15.5 |
| Rate 3 | -9.5 | -5.8 | -7.2 | -16.0 | -16.7 | -21.8 | -8.6 | -5.3 | -5.9 | -16.2 | -14.6 | -21.5 |
| Rate 4 | -9.6 | -6.2 | -5.3 | -13.6 | -14.9 | -19.8 | -8.8 | -5.5 | -4.3 | -13.6 | -13.1 | -19.1 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -6.4 | -6.6 | -7.8 | -13.2 | -14.2 | -19.8 | -6.1 | -7.0 | -8.1 | -13.1 | -14.2 | -20.1 |
| Rate 2 | -6.5 | -6.8 | -5.2 | -10.5 | -11.7 | -17.2 | -6.3 | -7.3 | -5.3 | -10.3 | -11.6 | -17.5 |
| Rate 3 | -8.7 | -8.4 | -10.7 | -15.7 | -19.4 | -24.1 | -8.4 | -9.1 | -10.9 | -15.5 | -19.3 | -24.7 |
| Rate 4 | -9.0 | -8.7 | -7.8 | -13.2 | -16.8 | -22.0 | -8.6 | -9.4 | -8.1 | -13.1 | -16.7 | -22.6 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -6.5 | -6.1 | -7.4 | -13.3 | -13.8 | -19.5 | -6.1 | -6.2 | -7.2 | -13.3 | -13.4 | -19.5 |
| Rate 2 | -6.7 | -6.3 | -4.8 | -10.6 | -11.5 | -16.9 | -6.3 | -6.4 | -4.7 | -10.5 | -11.0 | -16.9 |
| Rate 3 | -8.9 | -7.7 | -10.0 | -15.8 | -18.9 | -23.5 | -8.4 | -7.9 | -9.8 | -15.8 | -18.3 | -23.7 |
| Rate 4 | -9.1 | -8.1 | -7.4 | -13.3 | -16.5 | -21.4 | -8.7 | -8.2 | -7.2 | -13.3 | -15.9 | -21.5 |

# Table 5-10
# Estimated 2012 Peak Period Traffic Impacts of Value Pricing
# Scenario 9

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixed | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.50 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.00 | 1.00 | 1.00 |
| Rate 3 | 0.50 | 0.00 | 1.25 | 1.25 |
| Rate 4 | 0.75 | 0.00 | 1.50 | 1.50 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -6.7 | -4.7 | -4.2 | -11.6 | -10.9 | -16.3 | -6.3 | -5.0 | -3.3 | -11.8 | -9.6 | -16.7 |
| Rate 2 | -9.6 | -6.4 | -6.5 | -14.4 | -16.1 | -20.8 | -9.0 | -6.0 | -5.0 | -14.7 | -14.1 | -20.7 |
| Rate 3 | -10.0 | -6.1 | -4.5 | -12.8 | -14.6 | -19.0 | -10.0 | -5.4 | -3.6 | -13.0 | -13.6 | -18.4 |
| Rate 4 | -12.9 | -7.6 | -7.0 | -15.8 | -19.8 | -23.4 | -12.6 | -7.3 | -5.5 | -15.8 | -18.1 | -23.0 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -5.2 | -5.6 | -6.5 | -11.4 | -11.8 | -17.0 | -5.0 | -6.3 | -6.5 | -11.3 | -11.5 | -17.7 |
| Rate 2 | -7.8 | -7.9 | -9.8 | -14.0 | -17.5 | -21.9 | -7.4 | -8.8 | -9.8 | -14.1 | -17.2 | -23.0 |
| Rate 3 | -7.1 | -7.4 | -6.8 | -12.7 | -13.9 | -20.2 | -7.0 | -8.1 | -6.8 | -12.8 | -13.8 | -21.0 |
| Rate 4 | -9.4 | -9.7 | -10.5 | -15.3 | -19.9 | -24.9 | -9.2 | -10.8 | -10.4 | -15.6 | -19.6 | -26.4 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -5.5 | -5.4 | -6.2 | -11.4 | -11.6 | -16.8 | -5.3 | -5.9 | -5.9 | -11.5 | -11.1 | -17.4 |
| Rate 2 | -8.1 | -7.5 | -9.2 | -14.1 | -17.3 | -21.6 | -7.7 | -8.0 | -8.8 | -14.3 | -16.5 | -22.3 |
| Rate 3 | -7.6 | -7.1 | -6.5 | -12.8 | -14.0 | -19.9 | -7.6 | -7.3 | -6.1 | -12.9 | -13.7 | -20.2 |
| Rate 4 | -10.0 | -9.2 | -9.9 | -15.4 | -19.9 | -24.6 | -9.9 | -9.8 | -9.4 | -15.7 | -19.3 | -25.4 |

# Table 5-11
# Estimated 2012 Peak Period Traffic Impacts of Value Pricing
# Scenario 15

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixed | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.00 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.00 | 0.00 | 1.00 | 1.00 |
| Rate 3 | 0.00 | 0.00 | 1.25 | 1.25 |
| Rate 4 | 0.00 | 0.00 | 1.50 | 1.50 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | -4.9 | -2.7 | 0.0 | 0.0 | -4.9 | -2.7 | -5.1 | -2.9 | 0.0 | 0.0 | -5.1 | -2.9 |
| Rate 2 | -6.5 | -3.4 | 0.0 | 0.0 | -6.5 | -3.4 | -7.1 | -3.1 | 0.0 | 0.0 | -7.1 | -3.1 |
| Rate 3 | -7.9 | -4.1 | 0.0 | 0.0 | -7.9 | -4.1 | -8.5 | -3.6 | 0.0 | 0.0 | -8.5 | -3.6 |
| Rate 4 | -9.1 | -4.8 | 0.0 | 0.0 | -9.1 | -4.8 | -10.0 | -5.2 | 0.0 | 0.0 | -10.0 | -5.2 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | -2.6 | -3.4 | 0.0 | 0.0 | -2.6 | -3.4 | -2.8 | -3.9 | 0.0 | 0.0 | -2.8 | -3.9 |
| Rate 2 | -3.4 | -4.5 | 0.0 | 0.0 | -3.4 | -4.5 | -3.7 | -5.0 | 0.0 | 0.0 | -3.7 | -5.0 |
| Rate 3 | -4.1 | -5.6 | 0.0 | 0.0 | -4.1 | -5.6 | -4.4 | -6.3 | 0.0 | 0.0 | -4.4 | -6.3 |
| Rate 4 | -4.7 | -6.7 | 0.0 | 0.0 | -4.7 | -6.7 | -5.0 | -7.5 | 0.0 | 0.0 | -5.0 | -7.5 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | -3.0 | -3.2 | 0.0 | 0.0 | -3.0 | -3.2 | -3.2 | -3.6 | 0.0 | 0.0 | -3.2 | -3.6 |
| Rate 2 | -4.0 | -4.2 | 0.0 | 0.0 | -4.0 | -4.2 | -4.4 | -4.4 | 0.0 | 0.0 | -4.4 | -4.4 |
| Rate 3 | -4.7 | -5.2 | 0.0 | 0.0 | -4.7 | -5.2 | -5.2 | -5.5 | 0.0 | 0.0 | -5.2 | -5.5 |
| Rate 4 | -5.4 | -6.2 | 0.0 | 0.0 | -5.4 | -6.2 | -6.1 | -6.8 | 0.0 | 0.0 | -6.1 | -6.8 |

# Table 5-12
# Estimated 2012 Peak Period Traffic Impacts of Value Pricing
# Scenario 20

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Percent | Exit |

Value Pricing Conditions Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | 0.0% | 0.0% | 5.0% | 5.0% |
| Rate 2 | 0.0 | 0.0 | 10.0 | 10.0 |
| Rate 3 | 0.0 | 0.0 | 20.0 | 20.0 |
| Rate 4 | 0.0 | 0.0 | 30.0 | 30.0 |

| | A.M. Peak Period | | | | | | P.M. Peak Period | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | | Percent Traffic Diverted | | Percent Traffic Shifted | | Net Percent Traffic Impact | |
| | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks | Cars | Trucks |
| **Pittsburgh** | | | | | | | | | | | | |
| Rate 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 |
| Rate 2 | -0.2 | 0.0 | 0.0 | 0.0 | -0.2 | 0.0 | -0.3 | 0.0 | 0.0 | 0.0 | -0.3 | 0.0 |
| Rate 3 | -0.8 | -0.5 | 0.0 | 0.0 | -0.8 | -0.5 | -0.9 | -0.5 | 0.0 | 0.0 | -0.9 | -0.5 |
| Rate 4 | -1.4 | -1.4 | 0.0 | 0.0 | -1.4 | -1.4 | -1.8 | -1.0 | 0.0 | 0.0 | -1.8 | -1.0 |
| **Philadelphia** | | | | | | | | | | | | |
| Rate 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 2 | -0.2 | 0.0 | 0.0 | 0.0 | -0.2 | 0.0 | -0.2 | 0.0 | 0.0 | 0.0 | -0.2 | 0.0 |
| Rate 3 | -0.5 | -0.9 | 0.0 | 0.0 | -0.5 | -0.9 | -0.6 | -1.1 | 0.0 | 0.0 | -0.6 | -1.1 |
| Rate 4 | -1.0 | -1.8 | 0.0 | 0.0 | -1.0 | -1.8 | -1.1 | -2.0 | 0.0 | 0.0 | -1.1 | -2.0 |
| **Total** | | | | | | | | | | | | |
| Rate 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 2 | -0.2 | 0.0 | 0.0 | 0.0 | -0.2 | 0.0 | -0.2 | 0.0 | 0.0 | 0.0 | -0.2 | 0.0 |
| Rate 3 | -0.6 | -0.8 | 0.0 | 0.0 | -0.6 | -0.8 | -0.7 | -0.9 | 0.0 | 0.0 | -0.7 | -0.9 |
| Rate 4 | -1.1 | -1.7 | 0.0 | 0.0 | -1.1 | -1.7 | -1.2 | -1.7 | 0.0 | 0.0 | -1.2 | -1.7 |

**Table 5-13**
**Estimated 2002 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 1**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixedincr | Exit |

Value Pricing Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $61,889 | $12,068 | $73,957 | $44,506 | $73,687 | $118,193 | $192,151 | $81,901 | $16,792 | $98,692 | $49,726 | $76,330 | $126,055 | $224,747 | $20,011 | $4,724 | $24,735 | $5,219 | $2,643 | $7,862 | $32,597 | 32.3 | 39.1 | 33.4 | 11.7 | 3.6 | 6.7 | 17.0 |
| Rate 2 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 83,229 | 17,305 | 100,534 | 49,950 | 79,273 | 129,222 | 229,757 | 21,340 | 5,237 | 26,577 | 5,443 | 5,586 | 11,029 | 37,606 | 34.5 | 43.4 | 35.9 | 12.2 | 7.6 | 9.3 | 19.6 |
| Rate 3 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 86,497 | 18,289 | 104,786 | 51,317 | 76,982 | 128,299 | 233,085 | 24,608 | 6,222 | 30,829 | 6,810 | 3,295 | 10,105 | 40,934 | 39.8 | 51.6 | 41.7 | 15.3 | 4.5 | 8.5 | 21.3 |
| Rate 4 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 88,019 | 18,913 | 106,932 | 51,463 | 80,055 | 131,518 | 238,450 | 26,129 | 6,845 | 32,974 | 6,957 | 6,368 | 13,325 | 46,299 | 42.2 | 56.7 | 44.6 | 15.6 | 8.6 | 11.3 | 24.1 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $167,464 | $109,729 | $277,193 | $67,087 | $98,338 | $165,425 | $442,618 | $219,714 | $143,771 | $363,485 | $84,888 | $105,353 | $190,241 | $553,726 | $52,251 | $34,042 | $86,292 | $17,801 | $7,016 | $24,817 | $111,109 | 31.2 | 31.0 | 31.1 | 26.5 | 7.1 | 15.0 | 25.1 |
| Rate 2 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 228,196 | 152,961 | 381,156 | 85,224 | 113,172 | 198,396 | 579,553 | 60,732 | 43,231 | 103,963 | 18,137 | 14,835 | 32,972 | 136,935 | 36.3 | 39.4 | 37.5 | 27.0 | 15.1 | 19.9 | 30.9 |
| Rate 3 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 229,184 | 153,491 | 382,675 | 89,800 | 106,916 | 196,716 | 579,391 | 61,721 | 43,762 | 105,483 | 22,713 | 8,578 | 31,291 | 136,774 | 36.9 | 39.9 | 38.1 | 33.9 | 8.7 | 18.9 | 30.9 |
| Rate 4 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 238,507 | 164,097 | 402,605 | 90,144 | 114,909 | 205,053 | 607,658 | 71,044 | 54,368 | 125,412 | 23,057 | 16,572 | 39,628 | 165,040 | 42.4 | 49.5 | 45.2 | 34.4 | 16.9 | 24.0 | 37.3 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 2 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 3 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 4 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $396,288 | $156,728 | $553,016 | $233,111 | $330,408 | $563,519 | $1,116,536 | $468,550 | $195,494 | $664,043 | $256,132 | $340,066 | $596,197 | $1,260,240 | $72,262 | $38,766 | $111,027 | $23,020 | $9,659 | $32,679 | $143,706 | 18.2 | 24.7 | 20.1 | 9.9 | 2.9 | 5.8 | 12.9 |
| Rate 2 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 478,360 | 205,197 | 683,556 | 256,692 | 350,828 | 607,519 | 1,291,077 | 82,072 | 48,468 | 130,540 | 23,580 | 20,421 | 44,001 | 174,541 | 20.7 | 30.9 | 23.6 | 10.1 | 6.2 | 7.8 | 15.6 |
| Rate 3 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 482,616 | 206,711 | 689,327 | 262,635 | 342,281 | 604,916 | 1,294,243 | 86,329 | 49,984 | 136,312 | 29,523 | 11,873 | 41,396 | 177,708 | 21.8 | 31.9 | 24.6 | 12.7 | 3.6 | 7.3 | 15.9 |
| Rate 4 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 493,461 | 217,941 | 711,403 | 263,125 | 353,347 | 616,472 | 1,327,875 | 97,173 | 61,213 | 158,386 | 30,014 | 22,940 | 52,953 | 211,339 | 24.5 | 39.1 | 28.6 | 12.9 | 6.9 | 9.4 | 18.9 |

**Table 5-14**
**Estimated 2002 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 3**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixedincr | Exit |

Value Pricing Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $61,889 | $12,068 | $73,957 | $44,506 | $73,687 | $118,193 | $192,151 | $81,901 | $16,792 | $98,692 | $49,726 | $76,330 | $126,055 | $224,747 | $20,011 | $4,724 | $24,735 | $5,219 | $2,643 | $7,862 | $32,597 | 32.3 | 39.1 | 33.4 | 11.7 | 3.6 | 6.7 | 17.0 |
| Rate 2 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 83,229 | 17,305 | 100,534 | 49,950 | 79,273 | 129,222 | 229,757 | 21,340 | 5,237 | 26,577 | 5,443 | 5,586 | 11,029 | 37,606 | 34.5 | 43.4 | 35.9 | 12.2 | 7.6 | 9.3 | 19.6 |
| Rate 3 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 86,497 | 18,289 | 104,786 | 51,317 | 76,982 | 128,299 | 233,085 | 24,608 | 6,222 | 30,829 | 6,810 | 3,295 | 10,105 | 40,934 | 39.8 | 51.6 | 41.7 | 15.3 | 4.5 | 8.5 | 21.3 |
| Rate 4 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 88,019 | 18,913 | 106,932 | 51,463 | 80,055 | 131,518 | 238,450 | 26,129 | 6,845 | 32,974 | 6,957 | 6,368 | 13,325 | 46,299 | 42.2 | 56.7 | 44.6 | 15.6 | 8.6 | 11.3 | 24.1 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $167,464 | $109,729 | $277,193 | $67,087 | $98,338 | $165,425 | $442,618 | $219,714 | $143,771 | $363,485 | $84,888 | $105,353 | $190,241 | $553,726 | $52,251 | $34,042 | $86,292 | $17,801 | $7,016 | $24,817 | $111,109 | 31.2 | 31.0 | 31.1 | 26.5 | 7.1 | 15.0 | 25.1 |
| Rate 2 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 228,196 | 152,961 | 381,156 | 85,224 | 113,172 | 198,396 | 579,553 | 60,732 | 43,231 | 103,963 | 18,137 | 14,835 | 32,972 | 136,935 | 36.3 | 39.4 | 37.5 | 27.0 | 15.1 | 19.9 | 30.9 |
| Rate 3 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 229,184 | 153,491 | 382,675 | 89,800 | 106,916 | 196,716 | 579,391 | 61,721 | 43,762 | 105,483 | 22,713 | 8,578 | 31,291 | 136,774 | 36.9 | 39.9 | 38.1 | 33.9 | 8.7 | 18.9 | 30.9 |
| Rate 4 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 238,507 | 164,097 | 402,605 | 90,144 | 114,909 | 205,053 | 607,658 | 71,044 | 54,368 | 125,412 | 23,057 | 16,572 | 39,628 | 165,040 | 42.4 | 49.5 | 45.2 | 34.4 | 16.9 | 24.0 | 37.3 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $219,198 | $45,952 | $265,150 | $147,057 | $167,072 | $314,129 | $579,279 | $52,263 | $11,021 | $63,284 | $25,539 | $8,689 | $34,228 | $97,512 | 31.3 | 31.6 | 31.3 | 21.0 | 5.5 | 12.2 | 20.2 |
| Rate 2 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 226,382 | 48,753 | 275,135 | 147,548 | 176,858 | 324,406 | 599,542 | 59,447 | 13,822 | 73,269 | 26,030 | 18,475 | 44,505 | 117,775 | 35.6 | 39.6 | 36.3 | 21.4 | 11.7 | 15.9 | 24.4 |
| Rate 3 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 229,325 | 49,162 | 278,487 | 154,208 | 169,118 | 323,325 | 601,813 | 62,390 | 14,231 | 76,621 | 32,690 | 10,735 | 43,424 | 120,046 | 37.4 | 40.7 | 38.0 | 26.9 | 6.8 | 15.5 | 24.9 |
| Rate 4 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 237,264 | 52,406 | 289,670 | 154,633 | 179,165 | 333,797 | 623,468 | 70,329 | 17,475 | 87,804 | 33,115 | 20,782 | 53,896 | 141,701 | 42.1 | 50.0 | 43.5 | 27.3 | 13.1 | 19.3 | 29.4 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $396,288 | $156,728 | $553,016 | $233,111 | $330,408 | $563,519 | $1,116,536 | $520,813 | $206,515 | $727,327 | $281,671 | $348,755 | $630,425 | $1,357,752 | $124,525 | $49,787 | $174,311 | $48,559 | $18,348 | $66,907 | $241,218 | 31.4 | 31.8 | 31.5 | 20.8 | 5.6 | 11.9 | 21.6 |
| Rate 2 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 537,807 | 219,019 | 756,825 | 282,722 | 369,303 | 652,024 | 1,408,852 | 141,519 | 62,290 | 203,809 | 49,610 | 38,896 | 88,506 | 292,316 | 35.7 | 39.7 | 36.9 | 21.3 | 11.8 | 15.7 | 26.2 |
| Rate 3 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 545,006 | 220,942 | 765,948 | 295,325 | 353,016 | 648,340 | 1,414,289 | 148,719 | 64,215 | 212,933 | 62,213 | 22,608 | 84,820 | 297,754 | 37.5 | 41.0 | 38.5 | 26.7 | 6.8 | 15.1 | 26.7 |
| Rate 4 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 563,790 | 235,416 | 799,207 | 296,240 | 374,129 | 670,368 | 1,469,576 | 167,502 | 78,688 | 246,190 | 63,129 | 43,722 | 106,849 | 353,040 | 42.3 | 50.2 | 44.5 | 27.1 | 13.2 | 19.0 | 31.6 |

**Table 5-15**
**Estimated 2002 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 6**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixedincr | Both |

Value Pricing Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $61,889 | $12,068 | $73,957 | $44,506 | $73,687 | $118,193 | $192,151 | $88,806 | $19,126 | $107,932 | $52,252 | $77,380 | $129,630 | $237,562 | $26,917 | $7,058 | $33,975 | $7,746 | $3,693 | $11,437 | $45,411 | 43.5 | 58.5 | 45.9 | 17.4 | 5.0 | 9.7 | 23.6 |
| Rate 2 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 90,911 | 19,494 | 110,404 | 52,514 | 81,602 | 134,115 | 244,521 | 29,022 | 7,426 | 36,447 | 8,008 | 7,915 | 15,922 | 52,370 | 46.9 | 61.5 | 49.3 | 18.0 | 10.7 | 13.5 | 27.3 |
| Rate 3 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 95,157 | 21,425 | 116,582 | 54,715 | 78,267 | 132,982 | 249,564 | 33,268 | 9,357 | 42,625 | 10,209 | 4,580 | 14,789 | 57,413 | 53.8 | 77.5 | 57.6 | 22.9 | 6.2 | 12.5 | 29.9 |
| Rate 4 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 97,534 | 21,950 | 119,484 | 54,883 | 82,661 | 137,543 | 257,027 | 35,645 | 9,882 | 45,527 | 10,377 | 8,974 | 19,350 | 64,876 | 57.6 | 81.9 | 61.6 | 23.3 | 12.2 | 16.4 | 33.8 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $167,464 | $109,729 | $277,193 | $67,087 | $98,338 | $165,425 | $442,618 | $224,743 | $152,405 | $377,148 | $88,343 | $106,485 | $194,828 | $571,526 | $57,279 | $42,676 | $99,955 | $21,256 | $8,147 | $29,403 | $128,908 | 34.2 | 38.9 | 36.1 | 31.7 | 8.3 | 17.8 | 29.1 |
| Rate 2 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 235,917 | 161,474 | 397,390 | 88,755 | 115,668 | 204,423 | 601,815 | 68,453 | 51,745 | 120,197 | 21,668 | 17,330 | 38,998 | 159,197 | 40.9 | 47.2 | 43.4 | 32.3 | 17.6 | 23.6 | 36.0 |
| Rate 3 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 234,889 | 164,902 | 399,801 | 94,017 | 108,414 | 202,432 | 602,222 | 67,425 | 55,173 | 122,608 | 26,930 | 10,076 | 37,007 | 159,604 | 40.3 | 50.3 | 44.2 | 40.1 | 10.2 | 22.4 | 36.1 |
| Rate 4 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 246,995 | 175,626 | 422,623 | 94,454 | 117,776 | 212,229 | 634,852 | 79,531 | 65,897 | 145,430 | 27,367 | 19,438 | 46,804 | 192,234 | 47.5 | 60.1 | 52.5 | 40.8 | 19.8 | 28.3 | 43.4 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 2 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 3 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 4 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $396,288 | $156,728 | $553,016 | $233,111 | $330,408 | $563,519 | $1,116,536 | $480,484 | $206,462 | $686,946 | $262,113 | $342,248 | $604,361 | $1,291,307 | $84,196 | $49,734 | $133,930 | $29,002 | $11,840 | $40,842 | $174,772 | 21.2 | 31.7 | 24.2 | 12.4 | 3.6 | 7.2 | 15.7 |
| Rate 2 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 493,763 | 215,899 | 709,662 | 262,787 | 355,653 | 618,440 | 1,328,102 | 97,475 | 59,171 | 156,646 | 29,676 | 25,245 | 54,921 | 211,567 | 24.6 | 37.8 | 28.3 | 12.7 | 7.6 | 9.7 | 18.9 |
| Rate 3 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 496,981 | 221,258 | 718,239 | 270,250 | 345,064 | 615,314 | 1,333,553 | 100,693 | 64,530 | 165,223 | 37,139 | 14,656 | 51,795 | 217,018 | 25.4 | 41.2 | 29.9 | 15.9 | 4.4 | 9.2 | 19.4 |
| Rate 4 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 511,464 | 232,507 | 743,971 | 270,855 | 358,820 | 629,675 | 1,373,646 | 115,176 | 75,779 | 190,955 | 37,744 | 28,412 | 66,156 | 257,111 | 29.1 | 48.4 | 34.5 | 16.2 | 8.6 | 11.7 | 23.0 |

**Table 5-16**
**Estimated 2002 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 9**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixedincr | Exit |

Value Pricing Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.50 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.00 | 1.00 | 1.00 |
| Rate 3 | 0.50 | 0.00 | 1.25 | 1.25 |
| Rate 4 | 0.75 | 0.00 | 1.50 | 1.50 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $61,889 | $12,068 | $73,957 | $44,506 | $73,687 | $118,193 | $192,151 | $81,512 | $16,628 | $98,140 | $49,726 | $75,937 | $125,663 | $223,803 | $19,623 | $4,560 | $24,183 | $5,219 | $2,250 | $7,470 | $31,652 | 31.7 | 37.8 | 32.7 | 11.7 | 3.1 | 6.3 | 16.5 |
| Rate 2 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 86,088 | 18,214 | 104,302 | 51,317 | 76,458 | 127,775 | 232,077 | 24,199 | 6,146 | 30,345 | 6,810 | 2,771 | 9,581 | 39,926 | 39.1 | 50.9 | 41.0 | 15.3 | 3.8 | 8.1 | 20.8 |
| Rate 3 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 88,600 | 19,559 | 108,159 | 52,848 | 76,209 | 129,057 | 237,217 | 26,711 | 7,491 | 34,202 | 8,342 | 2,522 | 10,864 | 45,066 | 43.2 | 62.1 | 46.2 | 18.7 | 3.4 | 9.2 | 23.5 |
| Rate 4 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 90,997 | 21,378 | 112,374 | 54,189 | 76,750 | 130,939 | 243,313 | 29,107 | 9,310 | 38,417 | 9,682 | 3,063 | 12,745 | 51,162 | 47.0 | 77.1 | 51.9 | 21.8 | 4.2 | 10.8 | 26.6 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $167,464 | $109,729 | $277,193 | $67,087 | $98,338 | $165,425 | $442,618 | $217,562 | $140,890 | $358,452 | $84,888 | $103,872 | $188,761 | $547,213 | $50,098 | $31,161 | $81,259 | $17,801 | $5,535 | $23,336 | $104,595 | 29.9 | 28.4 | 29.3 | 26.5 | 5.6 | 14.1 | 23.6 |
| Rate 2 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 226,935 | 151,216 | 378,151 | 89,800 | 105,589 | 195,390 | 573,541 | 59,471 | 41,487 | 100,958 | 22,713 | 7,252 | 29,965 | $130,923 | 35.5 | 37.8 | 36.4 | 33.9 | 7.4 | 18.1 | 29.6 |
| Rate 3 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 227,860 | 156,988 | 384,848 | 94,333 | 104,398 | 198,731 | 583,578 | 60,397 | 47,258 | 107,655 | 27,245 | 6,061 | 33,306 | 140,961 | 36.1 | 43.1 | 38.8 | 40.6 | 6.2 | 20.1 | 31.8 |
| Rate 4 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 230,653 | 167,825 | 398,478 | 97,954 | 106,133 | 204,087 | 602,565 | 63,190 | 58,096 | 121,285 | 30,867 | 7,796 | 38,662 | 159,948 | 37.7 | 52.9 | 43.8 | 46.0 | 7.9 | 23.4 | 36.1 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 2 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 3 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 4 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $396,288 | $156,728 | $553,016 | $233,111 | $330,408 | $563,519 | $1,116,536 | $466,009 | $192,449 | $658,458 | $256,132 | $338,192 | $594,325 | $1,252,783 | $69,721 | $35,721 | $105,442 | $23,020 | $7,785 | $30,806 | $136,247 | 17.6 | 22.8 | 19.1 | 9.9 | 2.4 | 5.5 | 12.2 |
| Rate 2 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 479,958 | 204,361 | 684,319 | 262,635 | 340,430 | 603,066 | 1,287,385 | 83,670 | 47,633 | 131,303 | 29,523 | 10,023 | 39,546 | 170,849 | 21.1 | 30.4 | 23.7 | 12.7 | 3.0 | 7.0 | 15.3 |
| Rate 3 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 483,395 | 211,478 | 694,873 | 268,699 | 338,990 | 607,689 | 1,302,562 | 87,108 | 54,749 | 141,857 | 35,587 | 8,583 | 44,170 | 186,027 | 22.0 | 34.9 | 25.7 | 15.3 | 2.6 | 7.8 | 16.7 |
| Rate 4 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 488,585 | 224,134 | 712,718 | 273,661 | 341,266 | 614,927 | 1,327,645 | 92,297 | 67,406 | 159,702 | 40,549 | 10,859 | 51,407 | 211,110 | 23.3 | 43.0 | 28.9 | 17.4 | 3.3 | 9.1 | 18.9 |

**Table 5-17**
**Estimated 2002 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 15**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixedincr | Exit |

Value Pricing Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.00 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.00 | 0.00 | 1.00 | 1.00 |
| Rate 3 | 0.00 | 0.00 | 1.25 | 1.25 |
| Rate 4 | 0.00 | 0.00 | 1.50 | 1.50 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $61,889 | $12,068 | $73,957 | $44,506 | $73,687 | $118,193 | $192,151 | $80,667 | $15,586 | $96,254 | $50,660 | $73,687 | $124,347 | $220,600 | $18,778 | $3,518 | $22,296 | $6,153 | $0 | $6,153 | $28,450 | 30.3 | 29.2 | 30.1 | 13.8 | 0.0 | 5.2 | 14.8 |
| Rate 2 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 84,684 | 16,909 | 101,593 | 52,507 | 73,687 | 126,194 | 227,786 | 22,795 | 4,841 | 27,636 | 8,000 | 0 | 8,000 | 35,636 | 36.8 | 40.1 | 37.4 | 18.0 | 0.0 | 6.8 | 18.5 |
| Rate 3 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 87,527 | 18,320 | 105,847 | 54,218 | 73,687 | 127,905 | 233,752 | 25,638 | 6,252 | 31,890 | 9,711 | 0 | 9,711 | 41,601 | 41.4 | 51.8 | 43.1 | 21.8 | 0.0 | 8.2 | 21.7 |
| Rate 4 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 89,258 | 19,785 | 109,044 | 55,756 | 73,687 | 129,443 | 238,486 | 27,369 | 7,717 | 35,086 | 11,249 | 0 | 11,249 | 46,336 | 44.2 | 63.9 | 47.4 | 25.3 | 0.0 | 9.5 | 24.1 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $167,464 | $109,729 | $277,193 | $67,087 | $98,338 | $165,425 | $442,618 | $213,000 | $131,257 | $344,257 | $86,657 | $98,338 | $184,995 | $529,251 | $45,536 | $21,528 | $67,064 | $19,570 | $0 | $19,570 | $86,634 | 27.2 | 19.6 | 24.2 | 29.2 | 0.0 | 11.8 | 19.6 |
| Rate 2 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 219,588 | 138,547 | 358,135 | 92,029 | 98,338 | 190,367 | 548,502 | 52,125 | 28,817 | 80,942 | 24,942 | 0 | 24,942 | $105,884 | 31.1 | 26.3 | 29.2 | 37.2 | 0.0 | 15.1 | 23.9 |
| Rate 3 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 222,548 | 145,869 | 368,417 | 97,184 | 98,338 | 195,521 | 563,938 | 55,085 | 36,140 | 91,224 | 30,097 | 0 | 30,097 | 121,321 | 32.9 | 32.9 | 32.9 | 44.9 | 0.0 | 18.2 | 27.4 |
| Rate 4 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 222,451 | 153,101 | 375,551 | 101,325 | 98,338 | 199,662 | 575,214 | 54,987 | 43,371 | 98,359 | 34,238 | 0 | 34,238 | 132,596 | 32.8 | 39.5 | 35.5 | 51.0 | 0.0 | 20.7 | 30.0 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $213,665 | $42,151 | $255,816 | $149,375 | $158,383 | $307,758 | $563,574 | $46,730 | $7,220 | $53,950 | $27,857 | $0 | $27,857 | $81,807 | 28.0 | 20.7 | 26.7 | 22.9 | 0.0 | 10.0 | 17.0 |
| Rate 2 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 221,382 | 44,636 | 266,018 | 157,161 | 158,383 | 315,544 | 581,562 | 54,447 | 9,705 | 64,152 | 35,643 | 0 | 35,643 | 99,795 | 32.6 | 27.8 | 31.8 | 29.3 | 0.0 | 12.7 | 20.7 |
| Rate 3 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 225,611 | 47,157 | 272,768 | 164,590 | 158,383 | 322,973 | 595,741 | 58,676 | 12,226 | 70,902 | 43,072 | 0 | 43,072 | 113,974 | 35.1 | 35.0 | 35.1 | 35.4 | 0.0 | 15.4 | 23.7 |
| Rate 4 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 226,810 | 49,671 | 276,481 | 170,724 | 158,383 | 329,107 | 605,588 | 59,875 | 14,740 | 74,615 | 49,206 | 0 | 49,206 | 123,821 | 35.9 | 42.2 | 37.0 | 40.5 | 0.0 | 17.6 | 25.7 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $396,288 | $156,728 | $553,016 | $233,111 | $330,408 | $563,519 | $1,116,536 | $507,332 | $188,994 | $696,327 | $286,692 | $330,408 | $617,100 | $1,313,425 | $111,044 | $32,266 | $143,310 | $53,580 | $0 | $53,580 | $196,891 | 28.0 | 20.6 | 25.9 | 23.0 | 0.0 | 9.5 | 17.6 |
| Rate 2 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 525,654 | 200,092 | 725,746 | 301,697 | 330,408 | 632,105 | 1,357,850 | 129,367 | 43,363 | 172,730 | 68,585 | 0 | 68,585 | 241,315 | 32.6 | 27.7 | 31.2 | 29.4 | 0.0 | 12.2 | 21.6 |
| Rate 3 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 535,686 | 211,346 | 747,032 | 315,992 | 330,408 | 646,399 | 1,393,431 | 139,399 | 54,618 | 194,016 | 82,880 | 0 | 82,880 | 276,896 | 35.2 | 34.8 | 35.1 | 35.6 | 0.0 | 14.7 | 24.8 |
| Rate 4 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 538,519 | 222,557 | 761,076 | 327,805 | 330,408 | 658,212 | 1,419,288 | 142,231 | 65,828 | 208,060 | 94,693 | 0 | 94,693 | 302,753 | 35.9 | 42.0 | 37.6 | 40.6 | 0.0 | 16.8 | 27.1 |

**Table 5-18**
**Estimated 2002 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 20**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Percent | Exit |

Value Pricing Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | 0.0% | 0.0% | 5.0% | 5.0% |
| Rate 2 | 0.0 | 0.0 | 10.0 | 10.0 |
| Rate 3 | 0.0 | 0.0 | 20.0 | 20.0 |
| Rate 4 | 0.0 | 0.0 | 30.0 | 30.0 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $61,889 | $12,068 | $73,957 | $44,506 | $73,687 | $118,193 | $192,151 | $64,172 | $12,385 | $76,557 | $46,622 | $73,687 | $120,309 | $196,866 | $2,283 | $317 | $2,600 | $2,115 | $0 | $2,115 | $4,715 | 3.7 | 2.6 | 3.5 | 4.8 | 0.0 | 1.8 | 2.5 |
| Rate 2 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 66,555 | 12,728 | 79,282 | 48,682 | 73,687 | 122,369 | 201,651 | 4,665 | 660 | 5,325 | 4,176 | 0 | 4,176 | 9,501 | 7.5 | 5.5 | 7.2 | 9.4 | 0.0 | 3.5 | 4.9 |
| Rate 3 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 70,913 | 13,406 | 84,319 | 52,107 | 73,687 | 125,794 | 210,113 | 9,024 | 1,338 | 10,362 | 7,601 | 0 | 7,601 | 17,963 | 14.6 | 11.1 | 14.0 | 17.1 | 0.0 | 6.4 | 9.3 |
| Rate 4 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 74,807 | 14,132 | 88,939 | 55,948 | 73,687 | 129,635 | 218,575 | 12,918 | 2,064 | 14,982 | 11,442 | 0 | 11,442 | 26,424 | 20.9 | 17.1 | 20.3 | 25.7 | 0.0 | 9.7 | 13.8 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $167,464 | $109,729 | $277,193 | $67,087 | $98,338 | $165,425 | $442,618 | $172,430 | $111,522 | $283,952 | $70,221 | $98,338 | $168,559 | $452,511 | $4,967 | $1,792 | $6,759 | $3,134 | $0 | $3,134 | $9,893 | 3.0 | 1.6 | 2.4 | 4.7 | 0.0 | 1.9 | 2.2 |
| Rate 2 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 177,584 | 113,357 | 290,941 | 73,107 | 98,338 | 171,444 | 462,385 | 10,121 | 3,627 | 13,748 | 6,020 | 0 | 6,020 | 19,768 | 6.0 | 3.3 | 5.0 | 9.0 | 0.0 | 3.6 | 4.5 |
| Rate 3 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 186,827 | 117,028 | 303,855 | 78,206 | 98,338 | 176,544 | 480,399 | 19,363 | 7,299 | 26,662 | 11,119 | 0 | 11,119 | 37,781 | 11.6 | 6.7 | 9.6 | 16.6 | 0.0 | 6.7 | 8.5 |
| Rate 4 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 194,486 | 120,714 | 315,200 | 83,073 | 98,338 | 181,411 | 496,610 | 27,022 | 10,985 | 38,007 | 15,986 | 0 | 15,986 | 53,993 | 16.1 | 10.0 | 13.7 | 23.8 | 0.0 | 9.7 | 12.2 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $172,214 | $35,541 | $207,755 | $127,212 | $158,383 | $285,595 | $493,350 | $5,279 | $610 | $5,889 | $5,694 | $0 | $5,694 | $11,583 | 3.2 | 1.7 | 2.9 | 4.7 | 0.0 | 2.0 | 2.4 |
| Rate 2 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 177,702 | 36,173 | 213,875 | 132,619 | 158,383 | 291,002 | 504,877 | 10,767 | 1,242 | 12,009 | 11,101 | 0 | 11,101 | 23,110 | 6.4 | 3.6 | 5.9 | 9.1 | 0.0 | 4.0 | 4.8 |
| Rate 3 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 187,604 | 37,434 | 225,037 | 141,924 | 158,383 | 300,307 | 525,345 | 20,669 | 2,503 | 23,171 | 20,406 | 0 | 20,406 | 43,578 | 12.4 | 7.2 | 11.5 | 16.8 | 0.0 | 7.3 | 9.0 |
| Rate 4 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 196,014 | 38,713 | 234,727 | 151,416 | 158,383 | 309,799 | 544,525 | 29,079 | 3,782 | 32,861 | 29,898 | 0 | 29,898 | 62,758 | 17.4 | 10.8 | 16.3 | 24.6 | 0.0 | 10.7 | 13.0 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $396,288 | $156,728 | $553,016 | $233,111 | $330,408 | $563,519 | ######### | $408,816 | $159,448 | $568,264 | $244,055 | $330,408 | $574,463 | $1,142,727 | $12,529 | $2,719 | $15,248 | $10,943 | $0 | $10,943 | $26,191 | 3.2 | 1.7 | 2.8 | 4.7 | 0.0 | 1.9 | 2.3 |
| Rate 2 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 421,841 | 162,258 | 584,098 | 254,408 | 330,408 | 584,815 | 1,168,913 | 25,553 | 5,529 | 31,082 | 21,297 | 0 | 21,297 | 52,379 | 6.4 | 3.5 | 5.6 | 9.1 | 0.0 | 3.8 | 4.7 |
| Rate 3 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 445,344 | 167,868 | 613,211 | 272,237 | 330,408 | 602,645 | 1,215,857 | 49,056 | 11,140 | 60,195 | 39,126 | 0 | 39,126 | 99,322 | 12.4 | 7.1 | 10.9 | 16.8 | 0.0 | 6.9 | 8.9 |
| Rate 4 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 465,307 | 173,559 | 638,866 | 290,437 | 330,408 | 620,845 | 1,259,710 | 69,019 | 16,831 | 85,850 | 57,326 | 0 | 57,326 | 143,175 | 17.4 | 10.7 | 15.5 | 24.6 | 0.0 | 10.2 | 12.8 |

**Table 5-19**
**Estimated 2012 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 1**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixedincr | Exit |

Value Priced Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $74,205 | $20,522 | $94,727 | $61,945 | $102,104 | $164,049 | $258,776 | $101,447 | $27,575 | $129,022 | $69,745 | $105,989 | $175,734 | $304,757 | $27,242 | $7,053 | $34,296 | $7,800 | $3,885 | $11,685 | $45,981 | 36.7 | 34.4 | 36.2 | 12.6 | 3.8 | 7.1 | 17.8 |
| Rate 2 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 103,104 | 29,112 | 132,215 | 69,965 | 110,852 | 180,816 | 313,031 | 28,898 | 8,590 | 37,488 | 8,019 | 8,748 | 16,767 | 54,255 | 38.9 | 41.9 | 39.6 | 12.9 | 8.6 | 10.2 | 21.0 |
| Rate 3 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 107,669 | 29,644 | 137,313 | 72,165 | 106,978 | 179,143 | 316,456 | 33,464 | 9,122 | 42,586 | 10,220 | 4,874 | 15,094 | 57,680 | 45.1 | 44.4 | 45.0 | 16.5 | 4.8 | 9.2 | 22.3 |
| Rate 4 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 109,608 | 31,404 | 141,013 | 72,419 | 111,835 | 184,254 | 325,267 | 35,403 | 10,883 | 46,286 | 10,474 | 9,731 | 20,205 | 66,491 | 47.7 | 53.0 | 48.9 | 16.9 | 9.5 | 12.3 | 25.7 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $181,981 | $196,559 | $378,540 | $93,544 | $136,879 | $230,423 | $608,962 | $245,204 | $247,810 | $493,014 | $120,012 | $147,053 | $267,065 | $760,078 | $63,223 | $51,251 | $114,474 | $26,468 | $10,174 | $36,642 | $151,116 | 34.7 | 26.1 | 30.2 | 28.3 | 7.4 | 15.9 | 24.8 |
| Rate 2 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 254,639 | 269,470 | 524,109 | 120,512 | 159,651 | 280,163 | 804,272 | 72,658 | 72,912 | 145,569 | 26,968 | 22,772 | 49,740 | 195,309 | 39.9 | 37.1 | 38.5 | 28.8 | 16.6 | 21.6 | 32.1 |
| Rate 3 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 257,020 | 261,524 | 518,544 | 127,464 | 149,357 | 276,821 | 795,365 | 75,039 | 64,965 | 140,004 | 33,921 | 12,478 | 46,399 | 186,403 | 41.2 | 33.1 | 37.0 | 36.3 | 9.1 | 20.1 | 30.6 |
| Rate 4 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 267,365 | 285,175 | 552,540 | 127,910 | 162,178 | 290,088 | 842,629 | 85,385 | 88,616 | 174,001 | 34,366 | 25,299 | 59,666 | 233,666 | 46.9 | 45.1 | 46.0 | 36.7 | 18.5 | 25.9 | 38.4 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 2 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 3 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 4 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $465,856 | $278,909 | $744,765 | $320,632 | $452,800 | $773,432 | $1,518,196 | $556,321 | $337,213 | $893,534 | $354,900 | $466,859 | $821,759 | $1,715,293 | $90,465 | $58,304 | $148,770 | $34,268 | $14,059 | $48,327 | $197,097 | 19.4 | 20.9 | 20.0 | 10.7 | 3.1 | 6.2 | 13.0 |
| Rate 2 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 567,413 | 360,410 | 927,822 | 355,620 | 484,320 | 839,939 | 1,767,761 | 101,556 | 81,502 | 183,057 | 34,987 | 31,520 | 66,507 | 249,564 | 21.8 | 29.2 | 24.6 | 10.9 | 7.0 | 8.6 | 16.4 |
| Rate 3 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 574,359 | 352,996 | 927,355 | 364,772 | 470,152 | 834,924 | 1,762,279 | 108,503 | 74,087 | 182,590 | 44,141 | 17,352 | 61,493 | 244,083 | 23.3 | 26.6 | 24.5 | 13.8 | 3.8 | 8.0 | 16.1 |
| Rate 4 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 586,643 | 378,407 | 965,051 | 365,472 | 487,830 | 853,302 | 1,818,354 | 120,788 | 99,499 | 220,287 | 44,840 | 35,030 | 79,871 | 300,157 | 25.9 | 35.7 | 29.6 | 14.0 | 7.7 | 10.3 | 19.8 |

**Table 5-20**
**Estimated 2012 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 3**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixedincr | Exit |

Value Priced Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $74,205 | $20,522 | $94,727 | $61,945 | $102,104 | $164,049 | $258,776 | $101,447 | $27,575 | $129,022 | $69,745 | $105,989 | $175,734 | $304,757 | $27,242 | $7,053 | $34,296 | $7,800 | $3,885 | $11,685 | $45,981 | 36.7 | 34.4 | 36.2 | 12.6 | 3.8 | 7.1 | 17.8 |
| Rate 2 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 103,104 | 29,112 | 132,215 | 69,965 | 110,852 | 180,816 | 313,031 | 28,898 | 8,590 | 37,488 | 8,019 | 8,748 | 16,767 | 54,255 | 38.9 | 41.9 | 39.6 | 12.9 | 8.6 | 10.2 | 21.0 |
| Rate 3 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 107,669 | 29,644 | 137,313 | 72,165 | 106,978 | 179,143 | 316,456 | 33,464 | 9,122 | 42,586 | 10,220 | 4,874 | 15,094 | 57,680 | 45.1 | 44.4 | 45.0 | 16.5 | 4.8 | 9.2 | 22.3 |
| Rate 4 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 109,608 | 31,404 | 141,013 | 72,419 | 111,835 | 184,254 | 325,267 | 35,403 | 10,883 | 46,286 | 10,474 | 9,731 | 20,205 | 66,491 | 47.7 | 53.0 | 48.9 | 16.9 | 9.5 | 12.3 | 25.7 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $181,981 | $196,559 | $378,540 | $93,544 | $136,879 | $230,423 | $608,962 | $245,204 | $247,810 | $493,014 | $120,012 | $147,053 | $267,065 | $760,078 | $63,223 | $51,251 | $114,474 | $26,468 | $10,174 | $36,642 | $151,116 | 34.7 | 26.1 | 30.2 | 28.3 | 7.4 | 15.9 | 24.8 |
| Rate 2 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 254,639 | 269,470 | 524,109 | 120,512 | 159,651 | 280,163 | 804,272 | 72,658 | 72,912 | 145,569 | 26,968 | 22,772 | 49,740 | 195,309 | 39.9 | 37.1 | 38.5 | 28.8 | 16.6 | 21.6 | 32.1 |
| Rate 3 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 257,020 | 261,524 | 518,544 | 127,464 | 149,357 | 276,821 | 795,365 | 75,039 | 64,965 | 140,004 | 33,921 | 12,478 | 46,399 | 186,403 | 41.2 | 33.1 | 37.0 | 36.3 | 9.1 | 20.1 | 30.6 |
| Rate 4 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 267,365 | 285,175 | 552,540 | 127,910 | 162,178 | 290,088 | 842,629 | 85,385 | 88,616 | 174,001 | 34,366 | 25,299 | 59,666 | 233,666 | 46.9 | 45.1 | 46.0 | 36.7 | 18.5 | 25.9 | 38.4 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $283,284 | $78,171 | $361,455 | $202,165 | $226,210 | $428,375 | $789,830 | $73,614 | $16,343 | $89,957 | $37,022 | $12,393 | $49,415 | $139,372 | 35.1 | 26.4 | 33.1 | 22.4 | 5.8 | 13.0 | 21.4 |
| Rate 2 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 292,421 | 84,835 | 377,256 | 202,765 | 241,612 | 444,377 | 821,632 | 82,751 | 23,007 | 105,758 | 37,622 | 27,795 | 65,417 | 171,174 | 39.5 | 37.2 | 39.0 | 22.8 | 13.0 | 17.3 | 26.3 |
| Rate 3 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 297,899 | 82,626 | 380,525 | 212,750 | 229,186 | 441,935 | 822,461 | 88,229 | 20,798 | 109,027 | 47,607 | 15,369 | 62,975 | 172,003 | 42.1 | 33.6 | 40.2 | 28.8 | 7.2 | 16.6 | 26.4 |
| Rate 4 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 308,014 | 89,924 | 397,938 | 213,347 | 244,739 | 458,087 | 856,025 | 98,344 | 28,096 | 126,440 | 48,204 | 30,922 | 79,127 | 205,567 | 46.9 | 45.4 | 46.6 | 29.2 | 14.5 | 20.9 | 31.6 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $465,856 | $278,909 | $744,765 | $320,632 | $452,800 | $773,432 | $1,518,196 | $629,935 | $353,556 | $983,491 | $391,922 | $479,252 | $871,174 | $1,854,665 | $164,079 | $74,647 | $238,727 | $71,290 | $26,452 | $97,742 | $336,469 | 35.2 | 26.8 | 32.1 | 22.2 | 5.8 | 12.6 | 22.2 |
| Rate 2 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 650,164 | 383,417 | 1,033,580 | 393,242 | 512,115 | 905,356 | 1,938,935 | 184,307 | 104,509 | 288,815 | 72,609 | 59,315 | 131,924 | 420,738 | 39.6 | 37.5 | 38.8 | 22.6 | 13.1 | 17.1 | 27.7 |
| Rate 3 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 662,588 | 373,794 | 1,036,382 | 412,379 | 485,521 | 897,899 | 1,934,282 | 196,732 | 94,885 | 291,617 | 91,748 | 32,721 | 124,468 | 416,086 | 42.2 | 34.0 | 39.2 | 28.6 | 7.2 | 16.1 | 27.4 |
| Rate 4 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 684,987 | 406,503 | 1,091,491 | 413,676 | 518,752 | 932,429 | 2,023,921 | 219,132 | 127,595 | 346,727 | 93,044 | 65,952 | 158,998 | 505,724 | 47.0 | 45.7 | 46.6 | 29.0 | 14.6 | 20.6 | 33.3 |

**Table 5-21**
**Estimated 2012 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 6**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixedincr | Both |

Value Priced Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.25 | 0.75 | 0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |
| Rate 4 | 1.00 | 0.25 | 1.00 | 1.00 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $74,205 | $20,522 | $94,727 | $61,945 | $102,104 | $164,049 | $258,776 | $110,952 | $30,781 | $141,733 | $73,321 | $107,404 | $180,725 | $322,458 | $36,747 | $10,259 | $47,006 | $11,376 | $5,300 | $16,676 | $63,682 | 49.5 | 50.0 | 49.6 | 18.4 | 5.2 | 10.2 | 24.6 |
| Rate 2 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 113,596 | 32,354 | 145,950 | 73,561 | 114,078 | 187,639 | 333,589 | 39,391 | 11,832 | 51,223 | 11,616 | 11,974 | 23,590 | 74,813 | 53.1 | 57.7 | 54.1 | 18.8 | 11.7 | 14.4 | 28.9 |
| Rate 3 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 119,508 | 33,952 | 153,460 | 76,783 | 108,856 | 185,639 | 339,098 | 45,303 | 13,430 | 58,733 | 14,838 | 6,752 | 21,590 | 80,322 | 61.1 | 65.4 | 62.0 | 24.0 | 6.6 | 13.2 | 31.0 |
| Rate 4 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 123,620 | 35,945 | 159,565 | 77,743 | 116,718 | 194,462 | 354,026 | 49,415 | 15,423 | 64,838 | 15,798 | 14,614 | 30,413 | 95,250 | 66.6 | 75.2 | 68.4 | 25.5 | 14.3 | 18.5 | 36.8 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $181,981 | $196,559 | $378,540 | $93,544 | $136,879 | $230,423 | $608,962 | $252,710 | $259,780 | $512,490 | $124,782 | $148,755 | $273,537 | $786,027 | $70,729 | $63,221 | $133,950 | $31,238 | $11,876 | $43,114 | $177,065 | 38.9 | 32.2 | 35.4 | 33.4 | 8.7 | 18.7 | 29.1 |
| Rate 2 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 265,237 | 282,814 | 548,051 | 125,392 | 163,415 | 288,807 | 836,858 | 83,256 | 86,255 | 169,511 | 31,848 | 26,536 | 58,384 | 227,896 | 45.7 | 43.9 | 44.8 | 34.0 | 19.4 | 25.3 | 37.4 |
| Rate 3 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 265,352 | 277,168 | 542,521 | 133,387 | 151,567 | 284,954 | 827,475 | 83,371 | 80,609 | 163,981 | 39,843 | 14,688 | 54,531 | 218,513 | 45.8 | 41.0 | 43.3 | 42.6 | 10.7 | 23.7 | 35.9 |
| Rate 4 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 280,406 | 303,766 | 584,172 | 134,533 | 166,900 | 301,433 | 885,604 | 98,425 | 107,207 | 205,632 | 40,989 | 30,021 | 71,010 | 276,642 | 54.1 | 54.5 | 54.3 | 43.8 | 21.9 | 30.8 | 45.4 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 2 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 3 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 4 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $465,856 | $278,909 | $744,765 | $320,632 | $452,800 | $773,432 | $1,518,196 | $573,332 | $352,389 | $925,721 | $363,246 | $469,976 | $833,222 | $1,758,943 | $107,476 | $73,480 | $180,956 | $42,614 | $17,176 | $59,790 | $240,746 | 23.1 | 26.3 | 24.3 | 13.3 | 3.8 | 7.7 | 15.9 |
| Rate 2 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 588,503 | 376,996 | 965,499 | 364,096 | 491,310 | 855,406 | 1,820,905 | 122,647 | 98,087 | 220,734 | 43,464 | 38,510 | 81,974 | 302,708 | 26.3 | 35.2 | 29.6 | 13.6 | 8.5 | 10.6 | 19.9 |
| Rate 3 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 594,530 | 372,948 | 967,478 | 375,313 | 474,240 | 849,553 | 1,817,031 | 128,674 | 94,039 | 222,713 | 54,681 | 21,440 | 76,121 | 298,834 | 27.6 | 33.7 | 29.9 | 17.1 | 4.7 | 9.8 | 19.7 |
| Rate 4 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 613,696 | 401,539 | 1,015,235 | 377,419 | 497,435 | 874,854 | 1,890,089 | 147,840 | 122,630 | 270,470 | 56,787 | 44,635 | 101,422 | 371,892 | 31.7 | 44.0 | 36.3 | 17.7 | 9.9 | 13.1 | 24.5 |

**Table 5-22**
**Estimated 2012 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 9**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Urban | Fixedincr | Exit |

Value Priced Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.50 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.00 | 1.00 | 1.00 |
| Rate 3 | 0.50 | 0.00 | 1.25 | 1.25 |
| Rate 4 | 0.75 | 0.00 | 1.50 | 1.50 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $74,205 | $20,522 | $94,727 | $61,945 | $102,104 | $164,049 | $258,776 | $100,950 | $27,011 | $127,962 | $69,745 | $105,240 | $174,985 | $302,947 | $26,745 | $6,490 | $33,235 | $7,800 | $3,136 | $10,936 | $44,171 | 36.0 | 31.6 | 35.1 | 12.6 | 3.1 | 6.7 | 17.1 |
| Rate 2 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 107,149 | 29,309 | 136,458 | 72,165 | 106,202 | 178,367 | 314,825 | 32,944 | 8,787 | 41,731 | 10,220 | 4,098 | 14,318 | 56,049 | 44.4 | 42.8 | 44.1 | 16.5 | 4.0 | 8.7 | 21.7 |
| Rate 3 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 111,202 | 30,587 | 141,790 | 74,354 | 105,676 | 180,031 | 321,820 | 36,997 | 10,066 | 47,063 | 12,409 | 3,572 | 15,981 | 63,044 | 49.9 | 49.0 | 49.7 | 20.0 | 3.5 | 9.7 | 24.4 |
| Rate 4 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 115,201 | 33,141 | 148,342 | 76,368 | 106,617 | 182,985 | 331,327 | 40,996 | 12,620 | 53,615 | 14,423 | 4,513 | 18,936 | 72,551 | 55.2 | 61.5 | 56.6 | 23.3 | 4.4 | 11.5 | 28.0 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $181,981 | $196,559 | $378,540 | $93,544 | $136,879 | $230,423 | $608,962 | $242,780 | $240,807 | $483,587 | $120,012 | $144,862 | $264,874 | $748,460 | $60,799 | $44,248 | $105,047 | $26,468 | $7,983 | $34,451 | $139,498 | 33.4 | 22.5 | 27.8 | 28.3 | 5.8 | 15.0 | 22.9 |
| Rate 2 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 254,505 | 255,873 | 510,378 | 127,464 | 147,373 | 274,837 | 785,215 | 72,524 | 59,314 | 131,838 | 33,921 | 10,494 | 44,415 | $176,253 | 39.9 | 30.2 | 34.8 | 36.3 | 7.7 | 19.3 | 28.9 |
| Rate 3 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 257,577 | 258,300 | 515,877 | 134,243 | 145,596 | 279,839 | 795,716 | 75,596 | 61,741 | 137,337 | 40,699 | 8,717 | 49,416 | 186,753 | 41.5 | 31.4 | 36.3 | 43.5 | 6.4 | 21.4 | 30.7 |
| Rate 4 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 262,815 | 273,980 | 536,795 | 140,355 | 148,103 | 288,458 | 825,253 | 80,835 | 77,421 | 158,256 | 46,811 | 11,224 | 58,035 | 216,291 | 44.4 | 39.4 | 41.8 | 50.0 | 8.2 | 25.2 | 35.5 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 2 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 3 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rate 4 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $465,856 | $278,909 | $744,765 | $320,632 | $452,800 | $773,432 | $1,518,196 | $553,400 | $329,646 | $883,047 | $354,900 | $463,919 | $818,819 | $1,701,865 | $87,544 | $50,738 | $138,282 | $34,268 | $11,119 | $45,387 | $183,669 | 18.8 | 18.2 | 18.6 | 10.7 | 2.5 | 5.9 | 12.1 |
| Rate 2 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 571,324 | 347,010 | 918,334 | 364,772 | 467,392 | 832,164 | 1,750,498 | 105,468 | 68,101 | 173,569 | 44,141 | 14,592 | 58,733 | 232,302 | 22.6 | 24.4 | 23.3 | 13.8 | 3.2 | 7.6 | 15.3 |
| Rate 3 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 578,449 | 350,715 | 929,165 | 373,740 | 465,089 | 838,830 | 1,767,994 | 112,593 | 71,807 | 184,400 | 53,108 | 12,289 | 65,397 | 249,797 | 24.2 | 25.7 | 24.8 | 16.6 | 2.7 | 8.5 | 16.5 |
| Rate 4 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 587,686 | 368,949 | 956,635 | 381,866 | 468,537 | 850,403 | 1,807,038 | 121,831 | 90,041 | 211,871 | 61,234 | 15,737 | 76,971 | 288,842 | 26.2 | 32.3 | 28.4 | 19.1 | 3.5 | 10.0 | 19.0 |

**Table 5-23**
**Estimated 2012 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 15**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixedincr | Exit |

Value Priced Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.00 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.00 | 0.00 | 1.00 | 1.00 |
| Rate 3 | 0.00 | 0.00 | 1.25 | 1.25 |
| Rate 4 | 0.00 | 0.00 | 1.50 | 1.50 |

| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $74,205 | $20,522 | $94,727 | $61,945 | $102,104 | $164,049 | $258,776 | $99,908 | $24,757 | $124,665 | $70,994 | $102,104 | $173,098 | $297,763 | $25,703 | $4,236 | $29,938 | $9,049 | $0 | $9,049 | $38,987 | 34.6 | 20.6 | 31.6 | 14.6 | 0.0 | 5.5 | 15.1 |
| Rate 2 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 105,387 | 26,346 | 131,732 | 73,765 | 102,104 | 175,869 | 307,601 | 31,181 | 5,824 | 37,005 | 11,820 | 0 | 11,820 | 48,825 | 42.0 | 28.4 | 39.1 | 19.1 | 0.0 | 7.2 | 18.9 |
| Rate 3 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 109,841 | 28,020 | 137,861 | 76,289 | 102,104 | 178,392 | 316,253 | 35,636 | 7,498 | 43,134 | 14,343 | 0 | 14,343 | 57,477 | 48.0 | 36.5 | 45.5 | 23.2 | 0.0 | 8.7 | 22.2 |
| Rate 4 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 113,016 | 29,800 | 142,816 | 78,533 | 102,104 | 180,637 | 323,453 | 38,811 | 9,279 | 48,090 | 16,587 | 0 | 16,587 | 64,677 | 52.3 | 45.2 | 50.8 | 26.8 | 0.0 | 10.1 | 25.0 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $181,981 | $196,559 | $378,540 | $93,544 | $136,879 | $230,423 | $608,962 | $237,731 | $219,837 | $457,568 | $122,518 | $136,879 | $259,397 | $716,965 | $55,750 | $23,279 | $79,029 | $28,974 | $0 | $28,974 | $108,003 | 30.6 | 11.8 | 20.9 | 31.0 | 0.0 | 12.6 | 17.7 |
| Rate 2 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 246,324 | 227,700 | 474,024 | 130,662 | 136,879 | 267,541 | 741,565 | 64,343 | 31,141 | 95,485 | 37,118 | 0 | 37,118 | $132,603 | 35.4 | 15.8 | 25.2 | 39.7 | 0.0 | 16.1 | 21.8 |
| Rate 3 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 251,605 | 235,601 | 487,206 | 138,102 | 136,879 | 274,981 | 762,187 | 69,624 | 39,043 | 108,667 | 44,559 | 0 | 44,559 | 153,225 | 38.3 | 19.9 | 28.7 | 47.6 | 0.0 | 19.3 | 25.2 |
| Rate 4 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 253,515 | 243,443 | 496,958 | 145,043 | 136,879 | 281,922 | 778,880 | 71,534 | 46,884 | 118,418 | 51,499 | 0 | 51,499 | 169,918 | 39.3 | 23.9 | 31.3 | 55.1 | 0.0 | 22.3 | 27.9 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $276,235 | $69,706 | $345,941 | $205,317 | $213,817 | $419,134 | $765,074 | $66,565 | $7,878 | $74,443 | $40,174 | $0 | $40,174 | $114,616 | 31.7 | 12.7 | 27.4 | 24.3 | 0.0 | 10.6 | 17.6 |
| Rate 2 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 287,750 | 72,414 | 360,164 | 216,795 | 213,817 | 430,612 | 790,775 | 78,080 | 10,586 | 88,666 | 51,652 | 0 | 51,652 | 140,317 | 37.2 | 17.1 | 32.7 | 31.3 | 0.0 | 13.6 | 21.6 |
| Rate 3 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 295,722 | 75,160 | 370,882 | 227,316 | 213,817 | 441,133 | 812,015 | 86,052 | 13,332 | 99,384 | 62,173 | 0 | 62,173 | 161,557 | 41.0 | 21.6 | 36.6 | 37.6 | 0.0 | 16.4 | 24.8 |
| Rate 4 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 299,901 | 77,921 | 377,821 | 237,013 | 213,817 | 450,830 | 828,651 | 90,231 | 16,093 | 106,323 | 71,870 | 0 | 71,870 | 178,193 | 43.0 | 26.0 | 39.2 | 43.5 | 0.0 | 19.0 | 27.4 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $465,856 | $278,909 | $744,765 | $320,632 | $452,800 | $773,432 | $1,518,196 | $613,874 | $314,300 | $928,174 | $398,829 | $452,800 | $851,629 | $1,779,802 | $148,018 | $35,393 | $183,410 | $78,197 | $0 | $78,197 | $261,606 | 31.8 | 12.7 | 24.6 | 24.4 | 0.0 | 10.1 | 17.2 |
| Rate 2 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 639,461 | 326,460 | 965,920 | 421,222 | 452,800 | 874,022 | 1,839,941 | 173,604 | 47,551 | 221,156 | 100,590 | 0 | 100,590 | 321,745 | 37.3 | 17.0 | 29.7 | 31.4 | 0.0 | 13.0 | 21.2 |
| Rate 3 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 657,168 | 338,781 | 995,949 | 441,707 | 452,800 | 894,506 | 1,890,455 | 191,312 | 59,873 | 251,185 | 121,075 | 0 | 121,075 | 372,259 | 41.1 | 21.5 | 33.7 | 37.8 | 0.0 | 15.7 | 24.5 |
| Rate 4 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 666,432 | 351,164 | 1,017,595 | 460,589 | 452,800 | 913,389 | 1,930,984 | 200,576 | 72,256 | 272,831 | 139,956 | 0 | 139,956 | 412,788 | 43.1 | 25.9 | 36.6 | 43.7 | 0.0 | 18.1 | 27.2 |

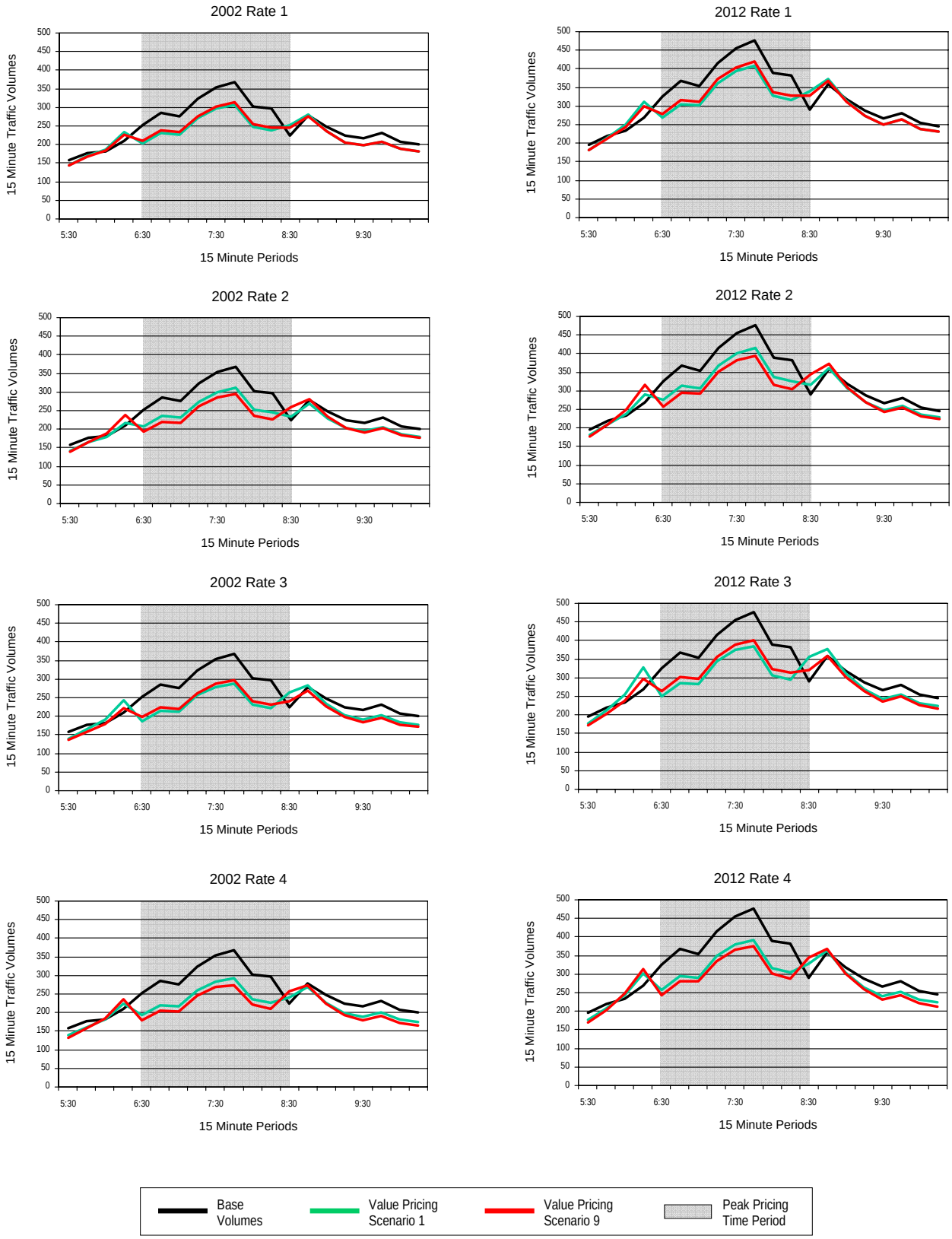
**Table 5-24**
**Estimated 2012 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 20**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Percent | Exit |

Value Priced Rates Tested

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | 0.0% | 0.0% | 5.0% | 5.0% |
| Rate 2 | 0.0 | 0.0 | 10.0 | 10.0 |
| Rate 3 | 0.0 | 0.0 | 20.0 | 20.0 |
| Rate 4 | 0.0 | 0.0 | 30.0 | 30.0 |

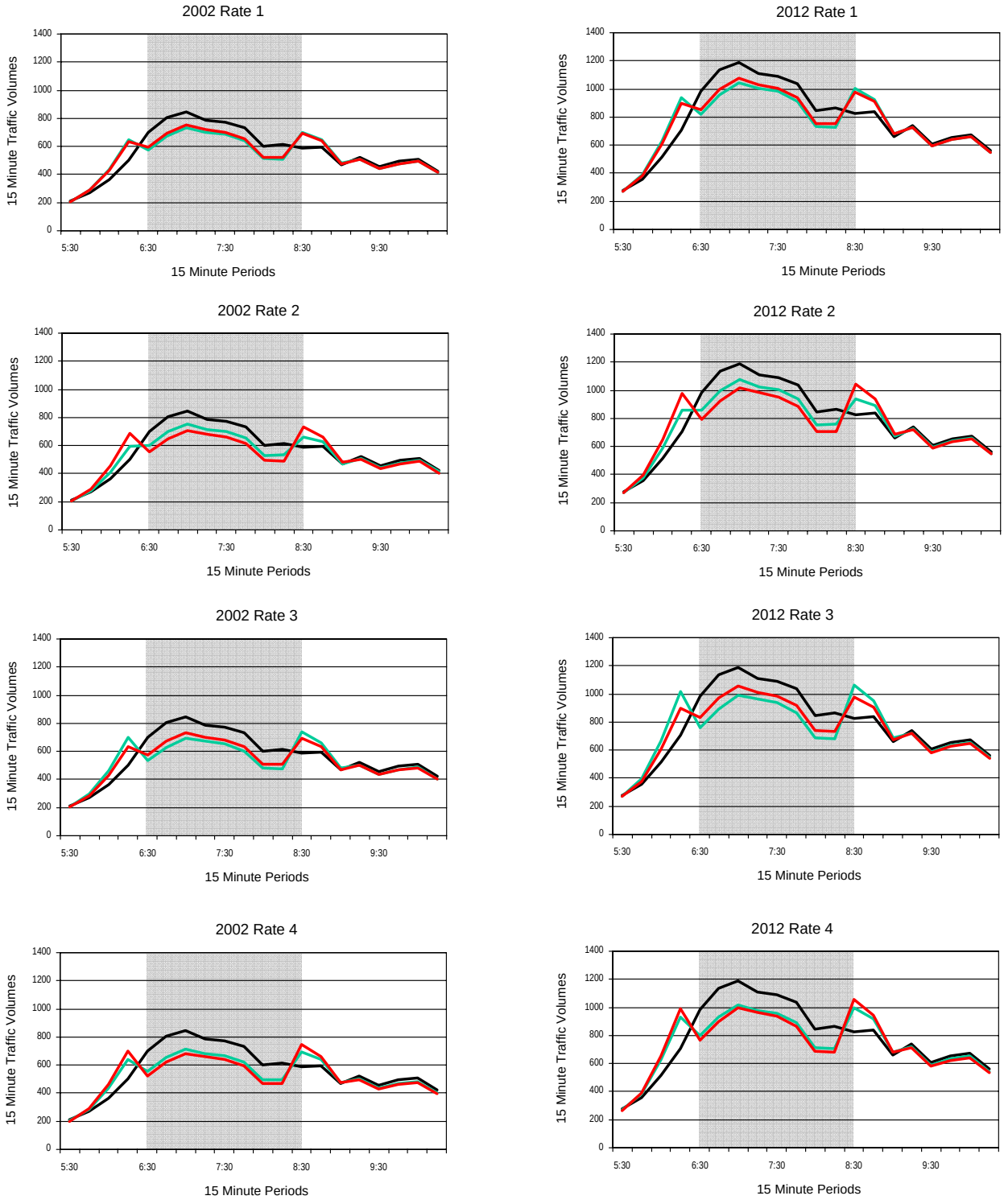
| | Existing Condition Weekday Ticket System Revenue | | | | | | | Value Priced Condition Weekday Revenue | | | | | | | Weekday Revenue Impact | | | | | | | Weekday Percent Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| **Pittsburgh** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $74,205 | $20,522 | $94,727 | $61,945 | $102,104 | $164,049 | $258,776 | $77,468 | $20,906 | $98,375 | $65,003 | $102,104 | $167,107 | $265,482 | $3,263 | $385 | $3,648 | $3,058 | $0 | $3,058 | $6,706 | 4.4 | 1.9 | 3.9 | 4.9 | 0.0 | 1.9 | 2.6 |
| Rate 2 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 80,500 | 21,307 | 101,808 | 67,974 | 102,104 | 170,078 | 271,886 | 6,295 | 786 | 7,081 | 6,029 | 0 | 6,029 | 13,110 | 8.5 | 3.8 | 7.5 | 9.7 | 0.0 | 3.7 | 5.1 |
| Rate 3 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 86,028 | 22,127 | 108,155 | 72,994 | 102,104 | 175,098 | 283,253 | 11,823 | 1,605 | 13,428 | 11,049 | 0 | 11,049 | 24,477 | 15.9 | 7.8 | 14.2 | 17.8 | 0.0 | 6.7 | 9.5 |
| Rate 4 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 90,999 | 22,979 | 113,978 | 78,227 | 102,104 | 180,330 | 294,308 | 16,794 | 2,457 | 19,251 | 16,281 | 0 | 16,281 | 35,532 | 22.6 | 12.0 | 20.3 | 26.3 | 0.0 | 9.9 | 13.7 |
| **Philadelphia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $181,981 | $196,559 | $378,540 | $93,544 | $136,879 | $230,423 | $608,962 | $188,899 | $198,520 | $387,419 | $98,149 | $136,879 | $235,028 | $622,447 | $6,918 | $1,961 | $8,880 | $4,606 | $0 | $4,606 | $13,485 | 3.8 | 1.0 | 2.3 | 4.9 | 0.0 | 2.0 | 2.2 |
| Rate 2 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 195,084 | 200,496 | 395,580 | 102,597 | 136,879 | 239,476 | 635,056 | 13,103 | 3,937 | 17,040 | 9,053 | 0 | 9,053 | 26,093 | 7.2 | 2.0 | 4.5 | 9.7 | 0.0 | 3.9 | 4.3 |
| Rate 3 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 205,829 | 204,466 | 410,294 | 109,892 | 136,879 | 246,771 | 657,065 | 23,848 | 7,907 | 31,755 | 16,349 | 0 | 16,349 | 48,103 | 13.1 | 4.0 | 8.4 | 17.5 | 0.0 | 7.1 | 7.9 |
| Rate 4 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 214,806 | 208,469 | 423,275 | 116,537 | 136,879 | 253,416 | 676,692 | 32,826 | 11,910 | 44,736 | 22,994 | 0 | 22,994 | 67,729 | 18.0 | 6.1 | 11.8 | 24.6 | 0.0 | 10.0 | 11.1 |
| **Non Urban** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $218,008 | $62,502 | $280,510 | $173,275 | $213,817 | $387,092 | $667,602 | $8,338 | $674 | $9,012 | $8,132 | $0 | $8,132 | $17,144 | 4.0 | 1.1 | 3.3 | 4.9 | 0.0 | 2.1 | 2.6 |
| Rate 2 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 225,552 | 63,188 | 288,740 | 181,132 | 213,817 | 394,949 | 683,689 | 15,882 | 1,360 | 17,242 | 15,989 | 0 | 15,989 | 33,231 | 7.6 | 2.2 | 6.4 | 9.7 | 0.0 | 4.2 | 5.1 |
| Rate 3 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 238,877 | 64,567 | 303,444 | 194,256 | 213,817 | 408,073 | 711,517 | 29,207 | 2,739 | 31,946 | 29,113 | 0 | 29,113 | 61,059 | 13.9 | 4.4 | 11.8 | 17.6 | 0.0 | 7.7 | 9.4 |
| Rate 4 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 250,297 | 65,965 | 316,261 | 206,904 | 213,817 | 420,721 | 736,983 | 40,627 | 4,137 | 44,763 | 41,761 | 0 | 41,761 | 86,525 | 19.4 | 6.7 | 16.5 | 25.3 | 0.0 | 11.0 | 13.3 |
| **System Wide** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $465,856 | $278,909 | $744,765 | $320,632 | $452,800 | $773,432 | $1,518,196 | $484,375 | $281,928 | $766,304 | $336,427 | $452,800 | $789,227 | $1,555,531 | $18,519 | $3,020 | $21,540 | $15,796 | $0 | $15,796 | $37,335 | 4.0 | 1.1 | 2.9 | 4.9 | 0.0 | 2.0 | 2.5 |
| Rate 2 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 501,136 | 284,991 | 786,128 | 351,703 | 452,800 | 804,503 | 1,590,631 | 35,280 | 6,083 | 41,363 | 31,071 | 0 | 31,071 | 72,434 | 7.6 | 2.2 | 5.6 | 9.7 | 0.0 | 4.0 | 4.8 |
| Rate 3 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 530,734 | 291,160 | 821,893 | 377,142 | 452,800 | 829,942 | 1,651,835 | 64,878 | 12,251 | 77,129 | 56,511 | 0 | 56,511 | 133,639 | 13.9 | 4.4 | 10.4 | 17.6 | 0.0 | 7.3 | 8.8 |
| Rate 4 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 556,102 | 297,413 | 853,514 | 401,668 | 452,800 | 854,467 | 1,707,983 | 90,247 | 18,504 | 108,750 | 81,036 | 0 | 81,036 | 189,786 | 19.4 | 6.6 | 14.6 | 25.3 | 0.0 | 10.5 | 12.5 |




# COMPARISON OF SCENARIOS 1 AND 9 VALUE PRICING IMPACTS AT 2002 AND 2012 LEVELS

## Interchange 6: A.M. Period

FIGURE 5-1

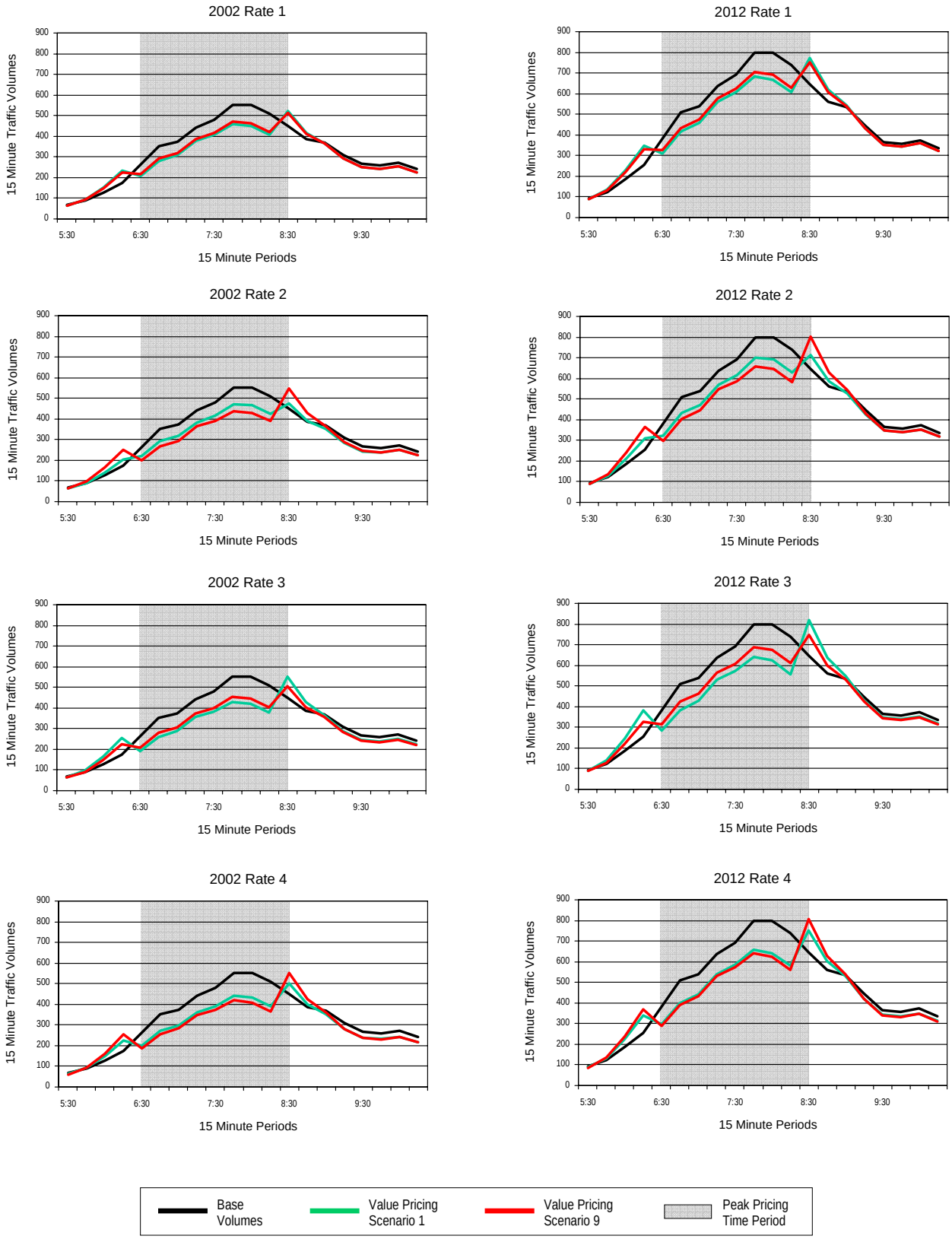



# COMPARISON OF SCENARIOS 1 AND 9 VALUE PRICING IMPACTS AT 2002 AND 2012 LEVELS

## Interchange 24: A.M. Period

FIGURE 5-2

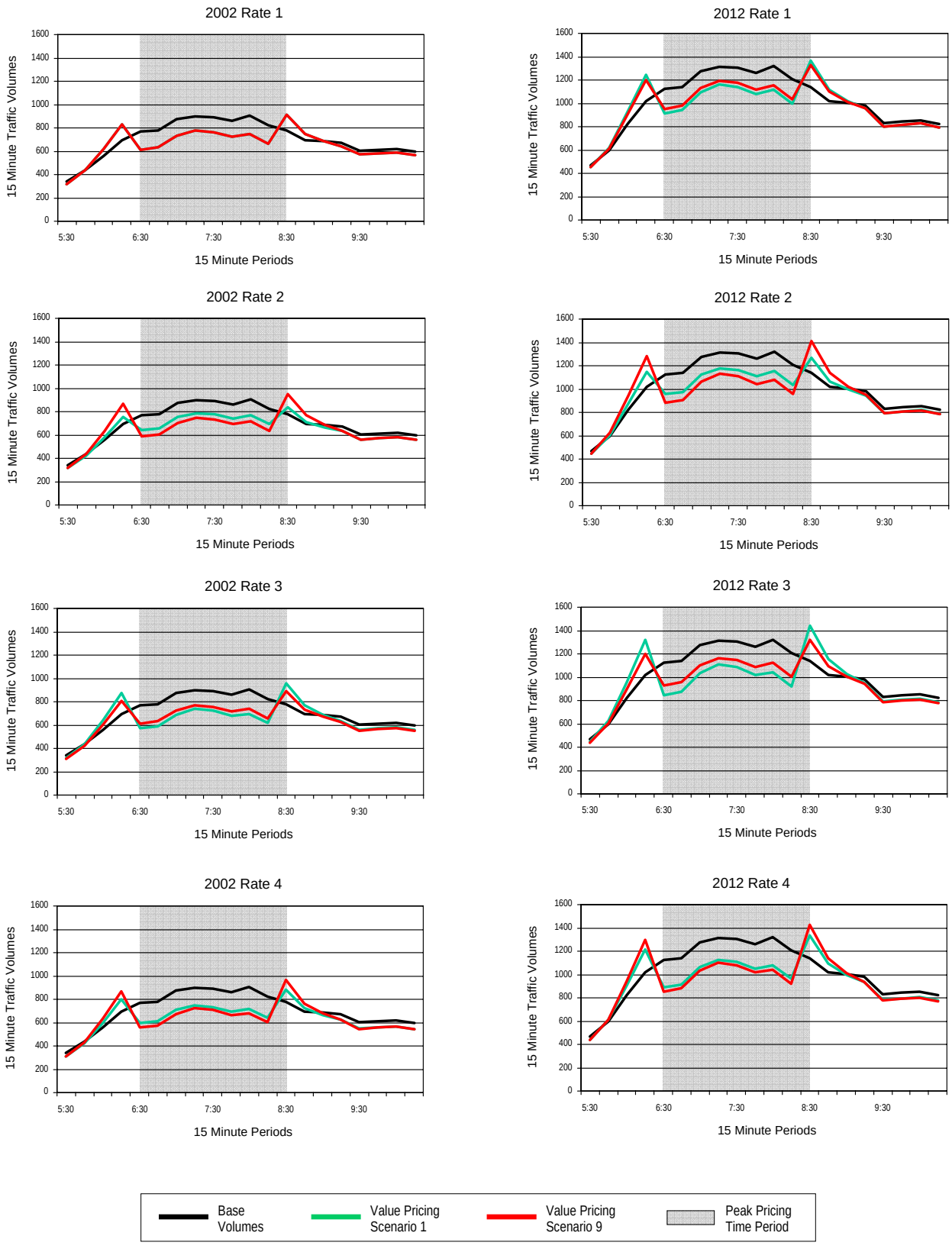
ENGINEERS
PLANNERS
ECONOMISTS
Wilbur Smith Associates




ENGINEERS
PLANNERS
ECONOMISTS
Wilbur Smith Associates

## COMPARISON OF SCENARIOS 1 AND 9 VALUE PRICING IMPACTS AT 2002 AND 2012 LEVELS
## Interchange 25: A.M. Period

FIGURE 5-3




ENGINEERS PLANNERS ECONOMISTS
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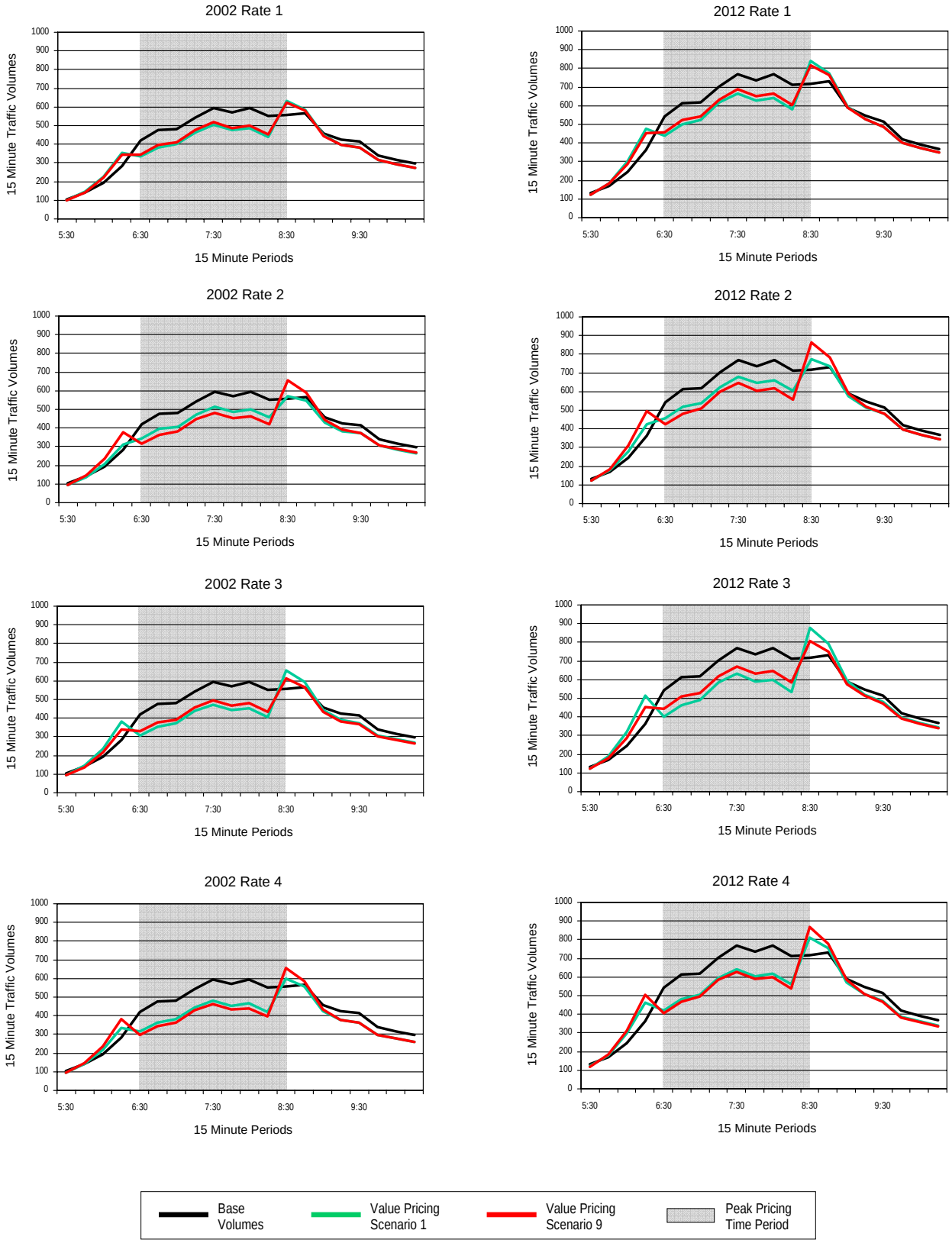
## COMPARISON OF SCENARIOS 1 AND 9 VALUE PRICING IMPACTS AT 2002 AND 2012 LEVELS

## Interchange 25A: A.M. Period

FIGURE 5-4

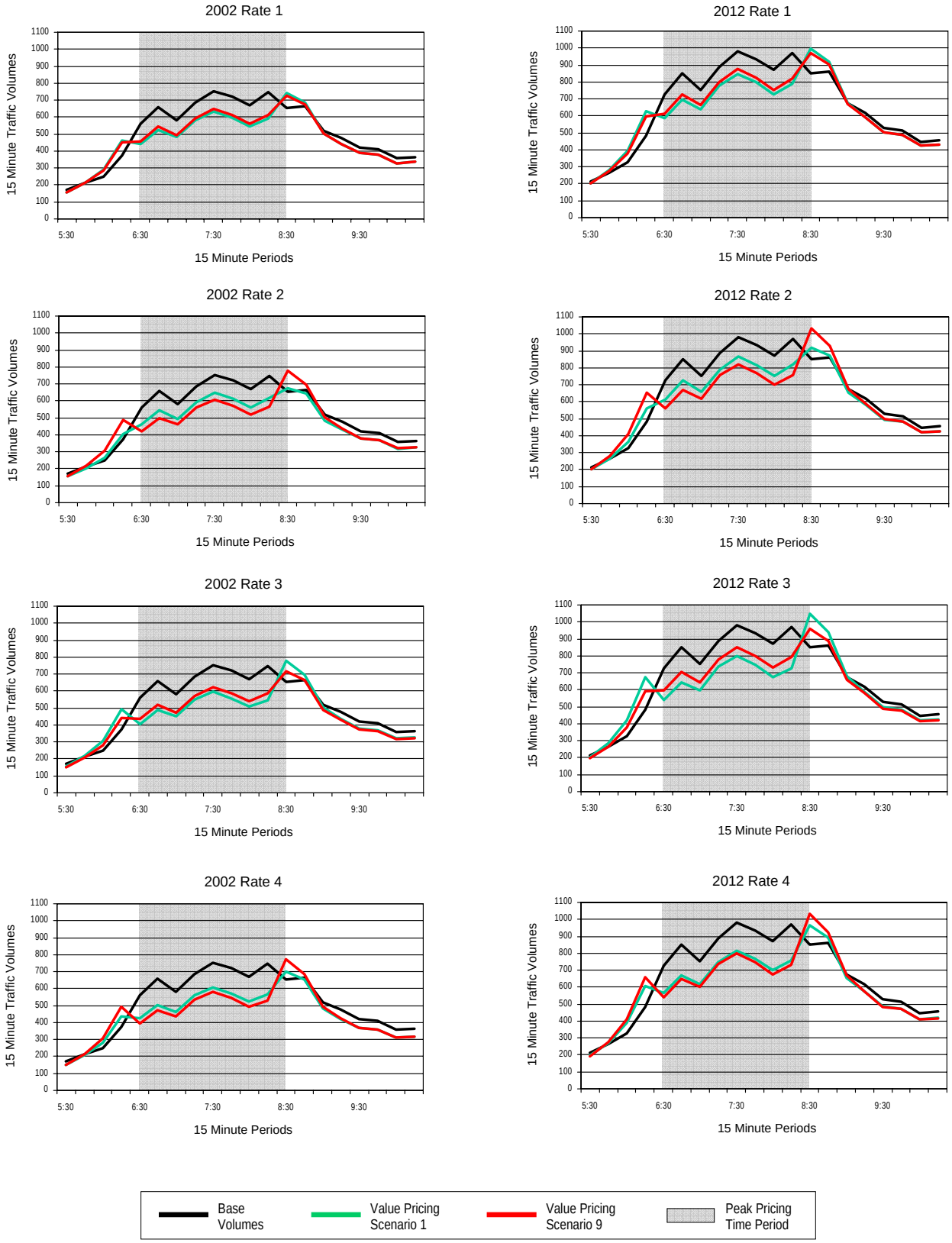



# COMPARISON OF SCENARIOS 1 AND 9 VALUE PRICING IMPACTS AT 2002 AND 2012 LEVELS

## Interchange 26: A.M. Period

FIGURE 5-5

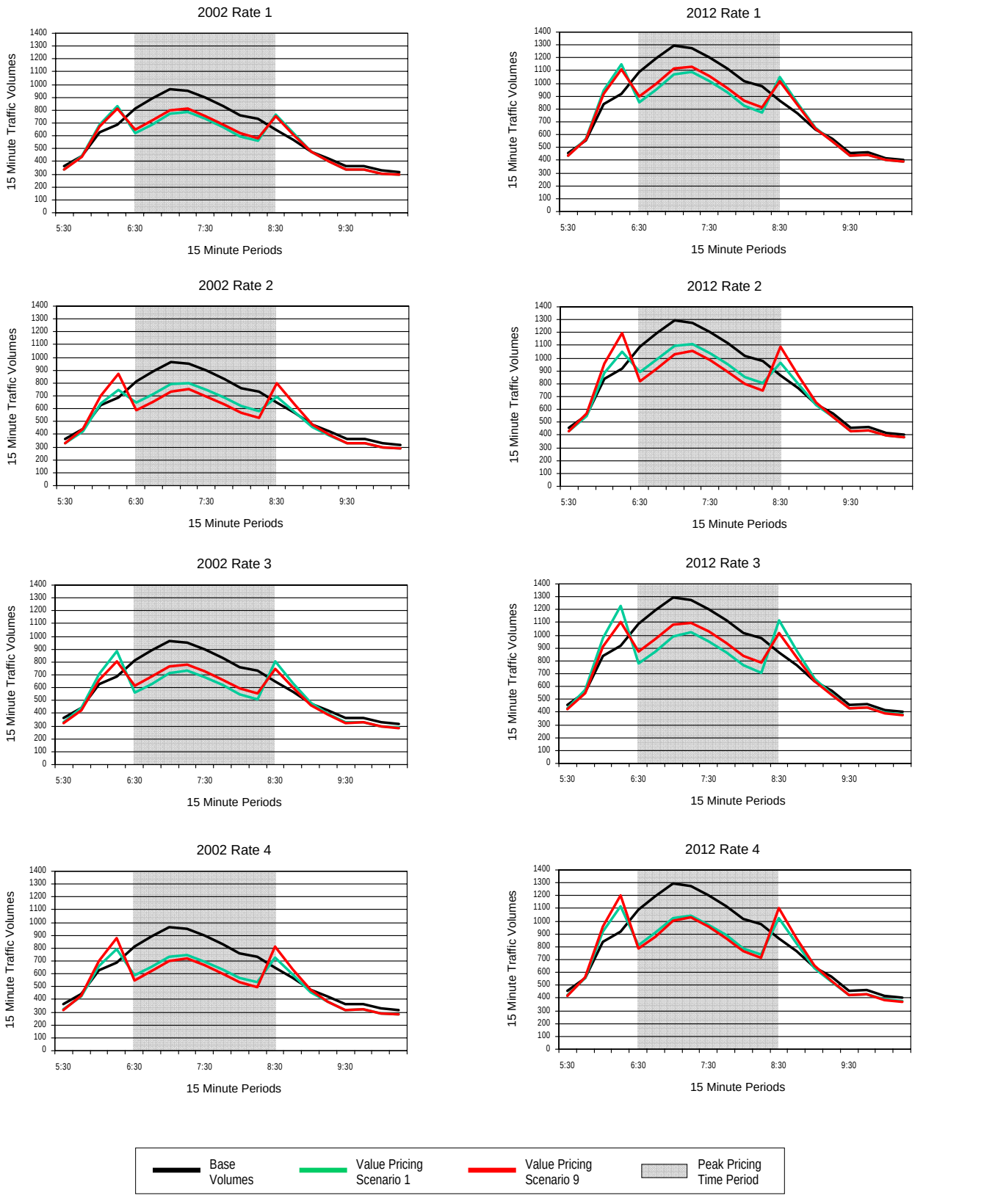
ENGINEERS
PLANNERS
ECONOMISTS
Wilbur Smith Associates




# COMPARISON OF SCENARIOS 1 AND 9 VALUE PRICING IMPACTS AT 2002 AND 2012 LEVELS

## Interchange 27: A.M. Period

FIGURE 5-6




ENGINEERS PLANNERS ECONOMISTS
Wilbur Smith Associates

# COMPARISON OF SCENARIOS 1 AND 9 VALUE PRICING IMPACTS AT 2002 AND 2012 LEVELS

## Interchange 28: A.M. Period

FIGURE 5-7

# CHAPTER 6

# REDUCED SHORT LIST AND ADDITIONAL MEASURES OF EFFECTIVENESS

This chapter will summarize the final, refined, "short list" of scenarios and rates selected by the PTC value pricing team for further analysis. As will be shown, the refined "short list" actually consists of two additional scenarios, but the number of rate differential options was reduced from four to two.

The remainder of this chapter presents various additional measures of effectiveness for the refined "short list". Included in this chapter are the estimated impact of each value pricing scenario on the Turnpike mainline segments, including a level of service analysis, the impact on toll plaza operations, and off-Turnpike impacts.

The final portions of this chapter provide a series of summary of comparative statistics by which to compare each of the scenarios selected for the reduced "short list". This would include measures such as traffic and revenue impacts, impacts on E-ZPass participation, and estimated operating cost impacts. While the PTC team did not select a preferred value pricing scenario for implementation, WSA did create a selection criteria matrix, which weights all of the measures analyzed in this study. The matrix product is a total "score" which allows for a final comparison of all scenarios tested.

## FINAL SET OF VALUE PRICING OPTIONS TESTED

Table 6-1 provides the final set of value pricing scenarios which would be analyzed in more detail. This is identical to the "short list" identified in Chapter 4, with the addition of Scenarios 17-1 and 17-9. As shown, these are really combinations of existing scenarios.

Scenario 17-1 is the same as Scenario 1 during the weekdays in the urban areas. But, it incorporates the simpler E-ZPass only discount approach of

Scenario 15 for the interurban areas on weekdays, and also on weekend days over the entire Ticket System.

Scenario 17-9 is identical to Scenario 17-1 except that it incorporates Scenario 9 value pricing concepts on weekdays in the urban areas. It is the same as Scenario 15 on weekends and on weekdays on the interurban portions of the System.

Table 6-2 presents the final toll rate differentials selected for further study. The rate assumptions for Scenarios 17-1 and 17-9 are also shown. These rates were selected by the PTC team after a review of previously discussed traffic and revenue impacts, and after having reviewed detailed shift impact information, such as that presented at the end of Chapter 5.

Similar to previous information shown for each value pricing scenario, Tables 6-3 through 6-6 provide the estimated revenue impacts of Scenarios 17-1 and 17-9 (at both 2002 and 2012 levels). The traffic impacts during the value pricing periods would be the same as previously shown for Scenarios 1 and 9 during weekday periods.

The net revenue impacts are quite similar between the two scenarios, and between the two years. At Rate 1 toll differentials, approximately 20 percent additional weekday revenue is generated. At the second rate tested, the positive revenue impact increases to about 25 percent.

## ESTIMATED TOLL PLAZA OPERATING IMPACTS

WSA conducted a toll plaza queuing and delay analysis to estimate the impact each value pricing scenario would have on estimated average and total delay. All toll plaza analyses were conducted only at 2012 levels.

Tables 6-7 and 6-8 provide a summary of the average delay per vehicle during the AM (Table 6-7) and PM periods (Table 6-8) at the entry side of each plaza. Only the highest volume plazas were analyzed as part of this study. The first row of each grouping shows the estimated existing condition (i.e., no value pricing) delay values.

As shown, in those cases where significant average delay exists, a significant reduction results from implementation of all value pricing scenarios except for Scenario 15, and especially for Scenario 20. These two scenarios do not allow for time of day tolling, thus improvements in average delay are relatively small.

Tables 6-9 and 6-10 show the same entering delay values, but this time for total delay at the plaza. This reflects the total accumulated delay for all motorists during the period. As would be expected, the same pattern occurs here as with average delay. Scenarios 15 and 20 do relatively little to improve operations compared to current conditions.

Tables 6-11 through 6-14 show all the same information, but for the exiting side of the toll plaza. Where significant delay is shown to occur, all scenarios show marked improvement, except for Scenarios 15 and 20. A graphical representation of all toll plaza delay analyses is shown in Appendix Figures 35-42.

## ESTIMATED MAINLINE IMPACTS AND LEVELS OF SERVICE

Figures 6-1 through 6-10 identify the estimated 2002 level traffic impacts on each mainline segment of the urban study area. The top figure on each page represents the two hour AM peak period and the bottom figure represents the two hour PM peak period. Appendix Figures 43-52 provide the same information at 2012 levels.

Some of the biggest impacts occur at Rate 3 levels for Scenarios 1, 3, and 17-1 (Figure 6-2) and for Scenario 6 (Figure 6-4). These impacts reflect both toll diversion and traffic shift to off-peak periods. Traffic reductions generally amount to between 1,500 and 2,000 between the heavily congested sections between Interchanges 25A and 28.

Scenario 20 impacts are minimal. As shown in Figure 6-9 and 6-10, the 10 and 20 percent rate increases do little to either divert or shift traffic during the AM and PM peak period. Typically, only about 100 or less vehicles are shown to be impacted, even on the most heavily used section of the Turnpike.

Figures 6-11 through 6-15 show the estimated Level of Service (LOS) on each mainline segment for each scenario at 2002 levels. As with the mainline traffic impact figures discussed above, the AM period is shown on the top of each page and the PM period is shown on the bottom. This same information is shown in tabular format in Tables 6-15 through 6-18.

The inner most LOS colored line shows the estimated existing condition LOS. The Rate 1 scenario toll assumptions are shown in the middle, and either Rate 2 or 3 impacts are shown in the outer colored line.

At 2002 levels, the Turnpike is shown to operate at generally acceptable levels. Only between Interchanges 25A and 26 are volumes shown to

result in LOS E conditions. Even LOS E can be considered acceptable (though not desirable) during peak conditions. Of course, these LOS values are meant to reflect normal operating conditions and do not reflect the possible reduction in LOS due to accidents, adverse weather, etc.

All value pricing scenarios tested, except for Scenarios 15 and 20 (Tables 6-14 and 6-15), improve the LOS to a minimum of LOS D. Scenarios 15 and 20 do not improve the LOS E shown between Interchanges 25A and 26 (in the westbound AM period).

By 2012 (Figures 6-16 through 6-20), conditions under the existing rate structure are estimated to reach LOS F on multiple segments of the Turnpike. Again, except for Scenarios 15 and 20, the value pricing scenarios tested result in significant mainline operating conditions. The only mainline segment that does not improve from an LOS F is the westbound mainline between Interchanges 25A and 26 (in the AM period). It should be pointed out that Rate 1 is not sufficient to eliminate the LOS F condition in the opposite direction along this segment, but the higher Rate 2 or 3 is.

## ESTIMATED OFF TURNPIKE TRAFFIC IMPACTS

An analysis was conducted to determine which local roads would likely be affected by each of the value pricing scenarios. The only impact on local roads would be from any diversion that might occur, not from the time shift component of the impact.

Figures 6-21 and 6-22 show the screenline of roads analyzed in both Philadelphia and Pittsburgh urban areas. Each road crossed by the screenline is designated with a number. For example, Screenline 1 (Figure 6-21) has a total of seven roads identified. Estimated traffic impacts were developed for each of these numbered crossings.

Tables 6-19 through 6-22 identify the estimated additional traffic on these roads, at the indicated locations for each value pricing scenario. These tables also reflect the loss of traffic on the Turnpike mainline at the point of the screenline crossing. The Turnpike traffic loss only represents that from diversion and does not include the additional shift of traffic to off-peak periods.

## COMPARATIVE SUMMARY IMPACTS

Tables 6-23 and 6-24 compare key statistics for each value pricing scenario at 2002 and 2012 levels. Shown are the revenue impacts, amount

of traffic shifted and diverted, and estimated impact on AM peak E-ZPass participation rates. It should be remembered that Scenarios 17-1 and 17-9 offer the largest revenue because they involve rate changes on the entire Turnpike, and on both weekdays and weekend days.

The E-ZPass market information in Tables 6-23 and 6-24 is a little misleading since in only involves a peak period. Because most of the value pricing strategies involve a pricing incentive for E-ZPass users to shift from the peak to the off-peak, it is reasonable not to expect great increases in peak period E-ZPass usage. Tables 6-25 provides a somewhat better representation of the expected impact on E-ZPass. This shows the estimated market share on a total daily basis. As shown, except for Scenario 20, total E-ZPass participation is shown to increase nearly identically for all scenarios.

Finally, tables 6-26 and 6-27 show the expected operating cost impacts for each of the value pricing scenarios. This was simply done by multiplying the expected gain, or loss, in traffic by a per transaction cost estimate. PTC staff provided WSA with per transaction costs of $0.17 for each E-ZPass transaction and $0.39 for each cash transaction.

The operating cost reductions for cash are the result of toll diversion and the shift into E-ZPass, while the operating cost increases are only the result of the cash shift into E-ZPass. Scenarios 17-1, 17-9 and 15 are estimated to provide net savings significantly greater than the other scenarios. Again, this is largely because they operate on a full system basis. Also, the second rate tested always provides a greater operating cost savings compared to Rate 1.

## VALUE PRICING SELECTION CRITERIA MATRIX

The final element of the value pricing work effort consisted in the development of a value pricing selection criteria matrix. This provides a framework in which to take into account the many elements of the study and quantify for each scenario. There is no doubt that this was a very subjective task, and the matrix was developed over a period of time with significant input from the PTC value pricing team.

Tables 6-28 and 6-29 show the ultimate, though I would still suggest in progress, selection criteria matrices. Each row represents one scenario and toll rate, with each column representing important study variables. Some of these are clearly measurable variables, such as “Revenue Impact”, or “Increased E-ZPass Participation”. Others, however, are much more subjective, though no less important, such as “Public Acceptance”.

Each variable was given a score based on the study results. As shown at the bottom of the tables, the scores ranged from 1-5, with 5 representing the greatest impact. The first row of the table shows the weighting factor each of these variables was assigned. The weighting factors represent the only difference between Tables 6-28 and 6-29.

Table 6-28 was meant to represent an interim value pricing condition, while Table 6-29 was meant to represent an ultimate value pricing condition. Thus, the weighting factor for increased revenue is relatively low (0.10) on an interim basis, but public acceptance is high (0.20). Ultimately, however, once implemented, the relative weighing changes such that revenue enhancements become more important (0.20 in Table 6-29) and public acceptance becomes less of an issue (0.10 in Table 6-29).

The overall idea is to develop a scoring system upon which to compare all scenarios. Based on the scoring and weighting factors used in Table 6-28, the highest total scores go to Scenarios 3, 15 and 20. It seems the key variables on which these three score high are ease of implementation, public acceptance, and for Scenarios 1 and 15 revenue impacts.

For the ultimate condition (Table 6-29) the three highest scoring scenarios are 3, 17-1 and 17-9. These score high on revenue impact and impact on interchange and mainline operations. Ultimately these are the important variables value pricing is intended to address.

Clearly, however, the results of these two tables can change dramatically with differing assumptions regarding not only the weighting of each variable, but the variables themselves. It is likely that additional discussion and refinement of these will be required in the event that some form of value pricing be considered for implementation on the Pennsylvania Turnpike.

**Table 6-1**

## Revised Value Pricing Scenario "Short List"

**Pennsylvania Turnpike Value Pricing Study**

| Scenario | Hours of Application | Area of Application | Discount Method | Time Delineation | Days of Application | Vehicle Applic. (1) | Typical Rate Differentials (2) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Cash | | | E-Zpass | | |
| | | | | | | | Peak | Off-Peak | Night | Peak | Off-Peak | Night |
| 1 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | + | + | + | 0 | 0 |
| 3 | 2 per peak | Full Turnpike | Fixed Increment | Exit | Weekdays | All | + | + | + | + | 0 | 0 |
| 6 | 2 per peak | Urban Areas | Fixed Increment | Entry or Exit | Weekdays | All | + | + | + | + | 0 | 0 |
| 9 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | + | + | - | 0 | 0 |
| 15 | All | Full Turnpike | Fixed Increment | None | All | All | + | + | + | 0 | 0 | 0 |
| 17-1 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | + | + | + | 0 | 0 |
| | All | Urban Areas | Fixed Increment | None | Weekend Days | All | + | + | + | 0 | 0 | 0 |
| | All | Interurban Areas | Fixed Increment | None | All | All | + | + | + | 0 | 0 | 0 |
| 17-9 | 2 per peak | Urban Areas | Fixed Increment | Exit | Weekdays | All | + | + | + | - | 0 | 0 |
| | All | Urban Areas | Fixed Increment | None | Weekend Days | All | + | + | + | 0 | 0 | 0 |
| | All | Interurban Areas | Fixed Increment | None | All | All | + | + | + | 0 | 0 | 0 |
| 20 | All | Full Turnpike | Percent Increment | None | All | All | + | + | + | 0 | 0 | 0 |
| 14 | Preferred | Preferred | Preferred | Preferred | Preferred | Preferred | - - - - - Preferrred - - - - - | | | - - - - - Preferrred - - - - - | | |
| 18 | All | Harrisburg-Downingtown | Percent | Preferred | Weekdays | Truck | 0 | 0 | 0 | - | - | - |
| 19 | Provide additional motorcycle discount on final preferred scenario (E-Zpass discount only, no change to cash toll rates). | | | | | | | | | | | |

(1) When "All" is indicated, impacts will be estimated for cars and trucks separately.

(2) A "+" indicates a rate higher than the current toll, a "-" indicates a rate lower than the "+" toll, and a "0" indicates no change from the current toll. At no time are rates to be tested which are lower than current toll rates. Thus, it should be recognized that a toll with a "-" sign, while lower than a toll with a "+" sign, is still greater than rates where no toll change is assumed (a "0" sign).

**Table 6-2**

## Revised Toll Rate Differentials
## Tested for Each Value Pricing Scenario

Pennsylvania Turnpike Value Pricing Study

DRAFT

| Applicable Scenario | | Rate | Cash Rates | | E-Zpass Rates | |
|---|---|---|---|---|---|---|
| | | | Peak | Off-Peak | Peak | Off-Peak |
| 1, 3, 6 | | 1 | $0.75 | $0.75 | $0.75 | $0.00 |
| | | 3 | 1.00 | 1.00 | 1.00 | 0.00 |
| 9 | | 1 | $0.75 | $0.75 | $0.50 | $0.00 |
| | | 2 | 1.00 | 1.00 | 0.75 | 0.00 |
| 15 | | 1 | $0.75 | $0.75 | $0.00 | $0.00 |
| | | 2 | 1.00 | 1.00 | 0.00 | 0.00 |
| 17-1 | Urban Weekday | 1 | $0.75 | $0.75 | $0.75 | $0.00 |
| | Urban Weekend | | 0.75 | 0.75 | 0.00 | 0.00 |
| | Interurban | | 0.75 | 0.75 | 0.00 | 0.00 |
| | Urban Weekday | 3 | $1.00 | $1.00 | $1.00 | $0.00 |
| | Urban Weekend | | 1.00 | 1.00 | 0.00 | 0.00 |
| | Interurban | | 1.00 | 1.00 | 0.00 | 0.00 |
| 17-9 | Urban Weekday | 1 | $0.75 | $0.75 | $0.50 | $0.00 |
| | Urban Weekend | | 0.75 | 0.75 | 0.00 | 0.00 |
| | Interurban | | 0.75 | 0.75 | 0.00 | 0.00 |
| | Urban Weekday | 2 | $1.00 | $1.00 | $0.75 | $0.00 |
| | Urban Weekend | | 1.00 | 1.00 | 0.00 | 0.00 |
| | Interurban | | 1.00 | 1.00 | 0.00 | 0.00 |
| 20 | | 2 | + 10% | + 10% | 0 % | 0 % |
| | | 3 | + 20% | + 20% | 0 % | 0 % |

**Table 6-3**
**Estimated 2002 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 17-1**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixedincr | Exit |

VP Rates Tested on Urban Interchanges (Weekday)

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |

VP Rates Tested on Inter Urban Interchanges (All Days)

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.00 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.00 | 0.00 | 1.00 | 1.00 |

| | Existing Condition Daily Ticket System Revenue | | | | | | | Value Priced Condition Daily Revenue | | | | | | | Daily Revenue Impact | | | | | | | Percent Daily Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| Pittsburgh | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $61,889 | $12,068 | $73,957 | $44,506 | $73,687 | $118,193 | $192,151 | $81,900 | $16,792 | $98,692 | $49,725 | $76,330 | $126,055 | $224,748 | $20,011 | $4,724 | $24,735 | $5,219 | $2,643 | $7,862 | $32,597 | 32.3 | 39.1 | 33.4 | 11.7 | 3.6 | 6.7 | 17.0 |
| Rate 3 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 86,497 | 18,290 | 104,786 | 51,316 | 76,982 | 128,298 | 233,085 | 24,608 | 6,222 | 30,829 | 6,810 | 3,295 | 10,105 | 40,934 | 39.8 | 51.6 | 41.7 | 15.3 | 4.5 | 8.5 | 21.3 |
| Philadelphia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $167,464 | $109,729 | $277,193 | $67,087 | $98,338 | $165,425 | $442,618 | $219,715 | $143,771 | $363,485 | $84,888 | $105,354 | $190,242 | $553,727 | $52,251 | $34,042 | $86,292 | $17,801 | $7,016 | $24,817 | $111,109 | 31.2 | 31.0 | 31.1 | 26.5 | 7.1 | 15.0 | 25.1 |
| Rate 3 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 229,185 | 153,491 | 382,676 | 89,800 | 106,916 | 196,716 | 579,392 | 61,721 | 43,762 | 105,483 | 22,713 | 8,578 | 31,291 | 136,774 | 36.9 | 39.9 | 38.1 | 33.9 | 8.7 | 18.9 | 30.9 |
| Non Urban | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $213,665 | $42,151 | $255,816 | $149,375 | $158,383 | $307,758 | $563,574 | $46,730 | $7,220 | $53,950 | $27,857 | $0 | $27,857 | $81,807 | 28.0 | 20.7 | 26.7 | 22.9 | 0.0 | 10.0 | 17.0 |
| Rate 2 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 221,382 | 44,636 | 266,018 | 157,161 | 158,383 | 315,544 | 581,562 | 54,447 | 9,705 | 64,152 | 35,643 | 0 | 35,643 | 99,795 | 32.6 | 27.8 | 31.8 | 29.3 | 0.0 | 12.7 | 20.7 |
| System Wide | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $396,288 | $156,728 | $553,016 | $233,111 | $330,408 | $563,519 | $1,116,536 | $515,280 | $202,714 | $717,993 | $283,988 | $340,067 | $624,055 | $1,342,049 | $118,992 | $45,986 | $164,977 | $50,877 | $9,659 | $60,536 | $225,513 | 30.0 | 29.3 | 29.8 | 21.8 | 2.9 | 10.7 | 20.2 |
| Rate 3 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 537,064 | 216,417 | 753,480 | 298,277 | 342,281 | 640,558 | 1,394,039 | 140,776 | 59,689 | 200,464 | 65,166 | 11,873 | 77,039 | 277,503 | 35.5 | 38.1 | 36.2 | 28.0 | 3.6 | 13.7 | 24.9 |

**Table 6-4**
**Estimated 2002 Total Weekday Revenue Impacts of Value Pricing**
**Scenario 17-9**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixedincr | Exit |

VP Rates Tested on Urban Interchanges (Weekday)

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.50 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.00 | 1.00 | 1.00 |

VP Rates Tested on Inter Urban Interchanges (All Days)

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.00 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.00 | 0.00 | 1.00 | 1.00 |

| | Existing Condition Daily Ticket System Revenue | | | | | | | Value Priced Condition Daily Revenue | | | | | | | Daily Revenue Impact | | | | | | | Percent Daily Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| Pittsburgh | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $61,889 | $12,068 | $73,957 | $44,506 | $73,687 | $118,193 | $192,151 | $81,512 | $16,628 | $98,140 | $49,725 | $75,937 | $125,663 | $223,803 | $19,623 | $4,560 | $24,183 | $5,219 | $2,250 | $7,470 | $31,652 | 31.7 | 37.8 | 32.7 | 11.7 | 3.1 | 6.3 | 16.5 |
| Rate 2 | 61,889 | 12,068 | 73,957 | 44,506 | 73,687 | 118,193 | 192,151 | 86,088 | 18,214 | 104,302 | 51,316 | 76,458 | 127,774 | 232,077 | 24,199 | 6,146 | 30,345 | 6,810 | 2,771 | 9,581 | 39,926 | 39.1 | 50.9 | 41.0 | 15.3 | 3.8 | 8.1 | 20.8 |
| Philadelphia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $167,464 | $109,729 | $277,193 | $67,087 | $98,338 | $165,425 | $442,618 | $217,562 | $140,890 | $358,452 | $84,888 | $103,873 | $188,761 | $547,213 | $50,098 | $31,161 | $81,259 | $17,801 | $5,535 | $23,336 | $104,595 | 29.9 | 28.4 | 29.3 | 26.5 | 5.6 | 14.1 | 23.6 |
| Rate 2 | 167,464 | 109,729 | 277,193 | 67,087 | 98,338 | 165,425 | 442,618 | 226,935 | 151,216 | 378,151 | 89,800 | 105,590 | 195,390 | 573,541 | 59,471 | 41,487 | 100,958 | 22,713 | 7,252 | 29,965 | 130,923 | 35.5 | 37.8 | 36.4 | 33.9 | 7.4 | 18.1 | 29.6 |
| Non Urban | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $166,935 | $34,931 | $201,866 | $121,518 | $158,383 | $279,901 | $481,767 | $213,665 | $42,151 | $255,816 | $149,375 | $158,383 | $307,758 | $563,574 | $46,730 | $7,220 | $53,950 | $27,857 | $0 | $27,857 | $81,807 | 28.0 | 20.7 | 26.7 | 22.9 | 0.0 | 10.0 | 17.0 |
| Rate 2 | 166,935 | 34,931 | 201,866 | 121,518 | 158,383 | 279,901 | 481,767 | 221,382 | 44,636 | 266,018 | 157,161 | 158,383 | 315,544 | 581,562 | 54,447 | 9,705 | 64,152 | 35,643 | 0 | 35,643 | 99,795 | 32.6 | 27.8 | 31.8 | 29.3 | 0.0 | 12.7 | 20.7 |
| System Wide | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $396,288 | $156,728 | $553,016 | $233,111 | $330,408 | $563,519 | $1,116,536 | $512,739 | $199,669 | $712,408 | $283,988 | $338,193 | $622,182 | $1,334,590 | $116,451 | $42,941 | $159,392 | $50,877 | $7,785 | $58,663 | $218,054 | 29.4 | 27.4 | 28.8 | 21.8 | 2.4 | 10.4 | 19.5 |
| Rate 2 | 396,288 | 156,728 | 553,016 | 233,111 | 330,408 | 563,519 | 1,116,536 | 534,405 | 214,066 | 748,471 | 298,277 | 340,431 | 638,708 | 1,387,180 | 138,117 | 57,338 | 195,455 | 65,166 | 10,023 | 75,189 | 270,644 | 34.9 | 36.6 | 35.3 | 28.0 | 3.0 | 13.3 | 24.2 |

**Table 6-5**
**Estimated 2012 Total Daily Revenue Impacts of Value Pricing**
**Scenario 17-1**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixedincr | Exit |

VP Rates Tested on Urban Interchanges (Weekday)

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.75 | $0.00 | $0.75 | $0.75 |
| Rate 3 | 1.00 | 0.00 | 1.00 | 1.00 |

VP Rates Tested on Inter Urban Interchanges (All Days)

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.00 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.00 | 0.00 | 1.00 | 1.00 |

| | Existing Condition Daily Ticket System Revenue | | | | | | | Value Priced Condition Daily Revenue | | | | | | | Daily Revenue Impact | | | | | | | Percent Daily Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| Pittsburgh | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $74,205 | $20,522 | $94,727 | $61,945 | $102,104 | $164,049 | $258,776 | $101,447 | $27,575 | $129,023 | $69,745 | $105,989 | $175,734 | $304,757 | $27,242 | $7,053 | $34,296 | $7,800 | $3,885 | $11,685 | $45,981 | 36.7 | 34.4 | 36.2 | 12.6 | 3.8 | 7.1 | 17.8 |
| Rate 3 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 107,669 | 29,644 | 137,313 | 72,165 | 106,978 | 179,143 | 316,456 | 33,464 | 9,122 | 42,586 | 10,220 | 4,874 | 15,094 | 57,680 | 45.1 | 44.4 | 45.0 | 16.5 | 4.8 | 9.2 | 22.3 |
| Philadelphia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $181,981 | $196,559 | $378,540 | $93,544 | $136,879 | $230,423 | $608,962 | $245,204 | $247,810 | $493,014 | $120,012 | $147,053 | $267,065 | $760,078 | $63,223 | $51,251 | $114,474 | $26,468 | $10,174 | $36,642 | $151,116 | 34.7 | 26.1 | 30.2 | 28.3 | 7.4 | 15.9 | 24.8 |
| Rate 3 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 257,020 | 261,524 | 518,544 | 127,465 | 149,357 | 276,822 | 795,365 | 75,039 | 64,965 | 140,004 | 33,921 | 12,478 | 46,399 | 186,403 | 41.2 | 33.1 | 37.0 | 36.3 | 9.1 | 20.1 | 30.6 |
| Non Urban | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $276,235 | $69,706 | $345,941 | $205,317 | $213,817 | $419,134 | $765,074 | $66,565 | $7,878 | $74,443 | $40,174 | $0 | $40,174 | $114,616 | 31.7 | 12.7 | 27.4 | 24.3 | 0.0 | 10.6 | 17.6 |
| Rate 2 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 287,750 | 72,414 | 360,164 | 216,795 | 213,817 | 430,612 | 790,775 | 78,080 | 10,586 | 88,666 | 51,652 | 0 | 51,652 | 140,317 | 37.2 | 17.1 | 32.7 | 31.3 | 0.0 | 13.6 | 21.6 |
| System Wide | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $465,856 | $278,909 | $744,765 | $320,632 | $452,800 | $773,432 | $1,518,196 | $622,886 | $345,091 | $967,978 | $395,074 | $466,859 | $861,933 | $1,829,909 | $157,030 | $66,182 | $223,213 | $74,442 | $14,059 | $88,501 | $311,713 | 33.7 | 23.7 | 30.0 | 23.2 | 3.1 | 11.4 | 20.5 |
| Rate 3 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 652,439 | 363,582 | 1,016,021 | 416,425 | 470,152 | 886,577 | 1,902,596 | 186,583 | 84,673 | 271,256 | 95,793 | 17,352 | 113,145 | 384,400 | 40.1 | 30.4 | 36.4 | 29.9 | 3.8 | 14.6 | 25.3 |

**Table 6-6**
**Estimated 2012 Total Daily Revenue Impacts of Value Pricing**
**Scenario 17-9**

| Hours | Area | Discount | Area of Application |
|---|---|---|---|
| 2 | Full | Fixedincr | Exit |

VP Rates Tested on Urban Interchanges (Weekday)

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.50 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.75 | 0.00 | 1.00 | 1.00 |

VP Rates Tested on Inter Urban Interchanges (All Days)

| | EZPass Peak | EZPass Offpeak | Cash Peak | Cash Offpeak |
|---|---|---|---|---|
| Rate 1 | $0.00 | $0.00 | $0.75 | $0.75 |
| Rate 2 | 0.00 | 0.00 | 1.00 | 1.00 |

| | Existing Condition Daily Ticket System Revenue | | | | | | | Value Priced Condition Daily Revenue | | | | | | | Daily Revenue Impact | | | | | | | Percent Daily Revenue Impact | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand | PC | | | CV | | | Grand |
| | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total | Cash | ETC | Total | Cash | ETC | Total | Total |
| Pittsburgh | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $74,205 | $20,522 | $94,727 | $61,945 | $102,104 | $164,049 | $258,776 | $100,950 | $27,012 | $127,962 | $69,745 | $105,240 | $174,985 | $302,947 | $26,745 | $6,490 | $33,235 | $7,800 | $3,136 | $10,936 | $44,171 | 36.0 | 31.6 | 35.1 | 12.6 | 3.1 | 6.7 | 17.1 |
| Rate 2 | 74,205 | 20,522 | 94,727 | 61,945 | 102,104 | 164,049 | 258,776 | 107,149 | 29,309 | 136,458 | 72,165 | 106,202 | 178,367 | 314,825 | 32,944 | 8,787 | 41,731 | 10,220 | 4,098 | 14,318 | 56,049 | 44.4 | 42.8 | 44.1 | 16.5 | 4.0 | 8.7 | 21.7 |
| Philadelphia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $181,981 | $196,559 | $378,540 | $93,544 | $136,879 | $230,423 | $608,962 | $242,780 | $240,807 | $483,587 | $120,012 | $144,862 | $264,874 | $748,460 | $60,799 | $44,248 | $105,047 | $26,468 | $7,983 | $34,451 | $139,498 | 33.4 | 22.5 | 27.8 | 28.3 | 5.8 | 15.0 | 22.9 |
| Rate 2 | 181,981 | 196,559 | 378,540 | 93,544 | 136,879 | 230,423 | 608,962 | 254,505 | 255,873 | 510,378 | 127,465 | 147,373 | 274,838 | 785,215 | 72,524 | 59,314 | 131,838 | 33,921 | 10,494 | 44,415 | $176,253 | 39.9 | 30.2 | 34.8 | 36.3 | 7.7 | 19.3 | 28.9 |
| Non Urban | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $209,670 | $61,828 | $271,498 | $165,143 | $213,817 | $378,960 | $650,458 | $276,235 | $69,706 | $345,941 | $205,317 | $213,817 | $419,134 | $765,074 | $66,565 | $7,878 | $74,443 | $40,174 | $0 | $40,174 | $114,616 | 31.7 | 12.7 | 27.4 | 24.3 | 0.0 | 10.6 | 17.6 |
| Rate 2 | 209,670 | 61,828 | 271,498 | 165,143 | 213,817 | 378,960 | 650,458 | 287,750 | 72,414 | 360,164 | 216,795 | 213,817 | 430,612 | 790,775 | 78,080 | 10,586 | 88,666 | 51,652 | 0 | 51,652 | 140,317 | 37.2 | 17.1 | 32.7 | 31.3 | 0.0 | 13.6 | 21.6 |
| System Wide | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rate 1 | $465,856 | $278,909 | $744,765 | $320,632 | $452,800 | $773,432 | $1,518,196 | $619,965 | $337,525 | $957,490 | $395,074 | $463,919 | $858,993 | $1,816,481 | $154,109 | $58,616 | $212,725 | $74,442 | $11,119 | $85,561 | $298,285 | 33.1 | 21.0 | 28.6 | 23.2 | 2.5 | 11.1 | 19.6 |
| Rate 2 | 465,856 | 278,909 | 744,765 | 320,632 | 452,800 | 773,432 | 1,518,196 | 649,404 | 357,596 | 1,007,000 | 416,425 | 467,392 | 883,817 | 1,890,815 | 183,548 | 78,687 | 262,235 | 95,793 | 14,592 | 110,385 | 372,619 | 39.4 | 28.2 | 35.2 | 29.9 | 3.2 | 14.3 | 24.5 |

**Table 6-7**
**Average Vehicle Delay by Payment Type Over the AM Peak Period**
**Entering Toll Plaza Lanes - Weekday Traffic Levels in 2012**
**Comparison of Toll Plaza Operations between Scenarios 1, 6, 9, 15 and 20**
**Pennsylvania Turnpike Value Pricing Study**

**Pittsburgh Plaza**
**Interchange 6/57**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 122 | 90 | 126 | 88 | 109 |
| Scenario 1, Rate 1 | 32 | 22 | 36 | 24 | 28 |
| Scenario 1, Rate 3 | 25 | 15 | 30 | 18 | 22 |
| Scenario 6, Rate 1 | 28 | 13 | 35 | 17 | 23 |
| Scenario 6, Rate 3 | 22 | 11 | 30 | 15 | 19 |
| Scenario 9, Rate 1 | 33 | 25 | 43 | 28 | 30 |
| Scenario 9, Rate 2 | 26 | 17 | 30 | 25 | 23 |
| Scenario 15, Rate 1 | 44 | 33 | 59 | 35 | 40 |
| Scenario 15, Rate 2 | 26 | 22 | 33 | 23 | 24 |
| Scenario 20, Rate 2 | 122 | 86 | 126 | 86 | 108 |
| Scenario 20, Rate 3 | 109 | 78 | 104 | 83 | 97 |

**New Stanton**
**Interchange 8/75**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 7 | 5 | 13 | 9 | 8 |
| 7 | 5 | 13 | 9 | 8 |
| 7 | 5 | 13 | 9 | 8 |
| 7 | 5 | 13 | 8 | 8 |
| 7 | 5 | 13 | 9 | 8 |
| 7 | 5 | 13 | 9 | 8 |
| 7 | 5 | 13 | 9 | 8 |
| 7 | 5 | 13 | 9 | 8 |
| 7 | 5 | 13 | 9 | 8 |
| 7 | 5 | 13 | 9 | 8 |
| 7 | 5 | 13 | 9 | 8 |

**Valley Forge**
**Interchange 24/326**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 15 | 10 | 21 | 13 | 13 |
| Scenario 1, Rate 1 | 12 | 7 | 18 | 11 | 10 |
| Scenario 1, Rate 3 | 10 | 6 | 15 | 9 | 8 |
| Scenario 6, Rate 1 | 9 | 6 | 15 | 9 | 8 |
| Scenario 6, Rate 3 | 9 | 5 | 14 | 9 | 7 |
| Scenario 9, Rate 1 | 11 | 7 | 17 | 10 | 9 |
| Scenario 9, Rate 2 | 10 | 6 | 15 | 10 | 8 |
| Scenario 15, Rate 1 | 13 | 8 | 18 | 11 | 10 |
| Scenario 15, Rate 2 | 10 | 7 | 16 | 13 | 8 |
| Scenario 20, Rate 2 | 14 | 9 | 19 | 13 | 12 |
| Scenario 20, Rate 3 | 12 | 8 | 18 | 12 | 11 |

**Mid-County**
**Interchange 25A/20**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 10 | 6 | 15 | 9 | 8 |
| 9 | 5 | 14 | 9 | 7 |
| 9 | 5 | 14 | 9 | 7 |
| 9 | 5 | 15 | 9 | 7 |
| 9 | 5 | 14 | 8 | 7 |
| 9 | 5 | 14 | 9 | 7 |
| 8 | 5 | 14 | 9 | 7 |
| 9 | 6 | 14 | 9 | 7 |
| 9 | 6 | 14 | 9 | 7 |
| 10 | 6 | 15 | 9 | 8 |
| 9 | 6 | 14 | 9 | 7 |

**Fort Washington**
**Interchange 26/339**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 430 | 364 | 432 | 409 | 392 |
| Scenario 1, Rate 1 | 155 | 122 | 158 | 119 | 135 |
| Scenario 1, Rate 3 | 86 | 66 | 86 | 63 | 74 |
| Scenario 6, Rate 1 | 134 | 107 | 146 | 99 | 118 |
| Scenario 6, Rate 3 | 63 | 49 | 71 | 50 | 55 |
| Scenario 9, Rate 1 | 194 | 154 | 193 | 157 | 169 |
| Scenario 9, Rate 2 | 105 | 85 | 118 | 86 | 94 |
| Scenario 15, Rate 1 | 301 | 253 | 310 | 246 | 269 |
| Scenario 15, Rate 2 | 266 | 212 | 270 | 221 | 228 |
| Scenario 20, Rate 2 | 426 | 364 | 422 | 401 | 390 |
| Scenario 20, Rate 3 | 410 | 338 | 407 | 316 | 364 |

**Willow Grove**
**Interchange 27/343**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 518 | 435 | 541 | 511 | 473 |
| 107 | 73 | 111 | 76 | 85 |
| 56 | 45 | 58 | 52 | 49 |
| 100 | 73 | 120 | 81 | 83 |
| 65 | 49 | 71 | 58 | 55 |
| 158 | 125 | 160 | 127 | 138 |
| 69 | 55 | 74 | 59 | 61 |
| 334 | 279 | 310 | 306 | 298 |
| 268 | 210 | 300 | 220 | 229 |
| 480 | 412 | 493 | 414 | 440 |
| 474 | 407 | 482 | 399 | 423 |

**Philadelphia**
**Interchange 28/351**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 737 | 115 | 761 | 117 | 325 |
| Scenario 1, Rate 1 | 174 | 86 | 192 | 85 | 121 |
| Scenario 1, Rate 3 | 64 | 52 | 64 | 58 | 57 |
| Scenario 6, Rate 1 | 139 | 79 | 167 | 79 | 104 |
| Scenario 6, Rate 3 | 63 | 50 | 66 | 54 | 56 |
| Scenario 9, Rate 1 | 257 | 94 | 278 | 97 | 155 |
| Scenario 9, Rate 2 | 70 | 57 | 78 | 58 | 62 |
| Scenario 15, Rate 1 | 482 | 107 | 523 | 108 | 218 |
| Scenario 15, Rate 2 | 488 | 109 | 509 | 110 | 212 |
| Scenario 20, Rate 2 | 707 | 114 | 732 | 115 | 313 |
| Scenario 20, Rate 3 | 658 | 109 | 683 | 111 | 295 |

**Lehigh Valley**
**Interchange 33/56**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 8 | 6 | 13 | 9 | 8 |
| 8 | 5 | 13 | 9 | 8 |
| 8 | 5 | 13 | 9 | 8 |
| 8 | 5 | 13 | 9 | 8 |
| 8 | 5 | 13 | 9 | 7 |
| 8 | 5 | 13 | 9 | 8 |
| 8 | 6 | 13 | 9 | 7 |
| 8 | 6 | 13 | 9 | 8 |
| 8 | 6 | 13 | 9 | 7 |
| 8 | 6 | 13 | 9 | 8 |
| 8 | 6 | 13 | 9 | 8 |

**Table 6-8**
**Average Vehicle Delay by Payment Type Over the PM Peak Period**
**Entering Toll Plaza Lanes - Weekday Traffic Levels in 2012**
**Comparison of Toll Plaza Operations between Scenarios 1, 6, 9, 15 and 20**
**Pennsylvania Turnpike Value Pricing Study**

**Pittsburgh Plaza**
**Interchange 6/57**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 442 | 401 | 443 | 493 | 435 |
| Scenario 1, Rate 1 | 80 | 72 | 92 | 76 | 79 |
| Scenario 1, Rate 3 | 17 | 15 | 23 | 19 | 17 |
| Scenario 6, Rate 1 | 52 | 48 | 59 | 50 | 51 |
| Scenario 6, Rate 3 | 11 | 10 | 16 | 14 | 11 |
| Scenario 9, Rate 1 | 164 | 135 | 164 | 142 | 156 |
| Scenario 9, Rate 2 | 20 | 17 | 26 | 22 | 19 |
| Scenario 15, Rate 1 | 283 | 243 | 302 | 259 | 271 |
| Scenario 15, Rate 2 | 187 | 150 | 187 | 152 | 175 |
| Scenario 20, Rate 2 | 441 | 374 | 409 | 471 | 431 |
| Scenario 20, Rate 3 | 420 | 363 | 403 | 338 | 405 |

**New Stanton**
**Interchange 8/75**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 8 | 5 | 14 | 9 | 8 |
| 8 | 5 | 13 | 8 | 8 |
| 7 | 5 | 13 | 9 | 8 |
| 8 | 5 | 13 | 8 | 8 |
| 8 | 5 | 13 | 8 | 8 |
| 8 | 5 | 12 | 8 | 8 |
| 8 | 5 | 13 | 9 | 8 |
| 8 | 5 | 13 | 9 | 8 |
| 8 | 5 | 12 | 8 | 8 |
| 8 | 5 | 13 | 8 | 8 |
| 8 | 5 | 13 | 8 | 8 |

**Valley Forge**
**Interchange 24/326**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 8 | 5 | 13 | 9 | 7 |
| Scenario 1, Rate 1 | 8 | 5 | 13 | 8 | 6 |
| Scenario 1, Rate 3 | 8 | 5 | 13 | 8 | 7 |
| Scenario 6, Rate 1 | 8 | 5 | 13 | 8 | 6 |
| Scenario 6, Rate 3 | 8 | 5 | 13 | 8 | 6 |
| Scenario 9, Rate 1 | 8 | 5 | 13 | 8 | 7 |
| Scenario 9, Rate 2 | 8 | 5 | 12 | 8 | 6 |
| Scenario 15, Rate 1 | 8 | 5 | 13 | 9 | 7 |
| Scenario 15, Rate 2 | 8 | 5 | 13 | 9 | 6 |
| Scenario 20, Rate 2 | 8 | 5 | 13 | 8 | 7 |
| Scenario 20, Rate 3 | 8 | 5 | 13 | 8 | 7 |

**Mid-County**
**Interchange 25A/20**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 330 | 234 | 338 | 233 | 281 |
| 48 | 28 | 54 | 34 | 39 |
| 23 | 11 | 32 | 14 | 18 |
| 61 | 35 | 74 | 40 | 49 |
| 25 | 13 | 31 | 16 | 19 |
| 70 | 45 | 73 | 49 | 57 |
| 30 | 17 | 35 | 21 | 24 |
| 138 | 95 | 135 | 97 | 113 |
| 105 | 72 | 99 | 75 | 84 |
| 301 | 218 | 299 | 224 | 257 |
| 272 | 185 | 250 | 179 | 225 |

**Fort Washington**
**Interchange 26/339**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 89 | 63 | 106 | 59 | 74 |
| Scenario 1, Rate 1 | 13 | 8 | 16 | 11 | 10 |
| Scenario 1, Rate 3 | 11 | 6 | 16 | 10 | 8 |
| Scenario 6, Rate 1 | 13 | 9 | 21 | 12 | 11 |
| Scenario 6, Rate 3 | 11 | 6 | 16 | 10 | 8 |
| Scenario 9, Rate 1 | 18 | 12 | 22 | 17 | 15 |
| Scenario 9, Rate 2 | 12 | 8 | 18 | 12 | 10 |
| Scenario 15, Rate 1 | 30 | 21 | 35 | 21 | 24 |
| Scenario 15, Rate 2 | 17 | 12 | 23 | 16 | 14 |
| Scenario 20, Rate 2 | 70 | 53 | 85 | 59 | 60 |
| Scenario 20, Rate 3 | 65 | 46 | 82 | 58 | 53 |

**Willow Grove**
**Interchange 27/343**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 490 | 364 | 483 | 417 | 418 |
| 144 | 104 | 155 | 115 | 123 |
| 27 | 17 | 34 | 18 | 22 |
| 115 | 82 | 121 | 86 | 97 |
| 24 | 16 | 32 | 17 | 20 |
| 132 | 95 | 155 | 99 | 111 |
| 37 | 25 | 45 | 29 | 30 |
| 229 | 174 | 233 | 180 | 193 |
| 117 | 87 | 192 | 94 | 98 |
| 451 | 354 | 475 | 363 | 393 |
| 448 | 340 | 434 | 365 | 383 |

**Philadelphia**
**Interchange 28/351**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 63 | 14 | 70 | 17 | 37 |
| Scenario 1, Rate 1 | 16 | 6 | 21 | 9 | 11 |
| Scenario 1, Rate 3 | 15 | 6 | 21 | 9 | 11 |
| Scenario 6, Rate 1 | 16 | 6 | 21 | 9 | 11 |
| Scenario 6, Rate 3 | 14 | 6 | 20 | 10 | 10 |
| Scenario 9, Rate 1 | 14 | 6 | 19 | 9 | 10 |
| Scenario 9, Rate 2 | 15 | 6 | 20 | 9 | 10 |
| Scenario 15, Rate 1 | 14 | 7 | 19 | 11 | 10 |
| Scenario 15, Rate 2 | 12 | 6 | 17 | 10 | 9 |
| Scenario 20, Rate 2 | 42 | 14 | 44 | 17 | 28 |
| Scenario 20, Rate 3 | 27 | 11 | 33 | 16 | 19 |

**Lehigh Valley**
**Interchange 33/56**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 9 | 6 | 14 | 9 | 8 |
| 9 | 5 | 14 | 9 | 8 |
| 8 | 5 | 14 | 9 | 7 |
| 8 | 5 | 13 | 8 | 7 |
| 8 | 5 | 13 | 8 | 7 |
| 8 | 6 | 14 | 9 | 8 |
| 8 | 6 | 13 | 9 | 8 |
| 8 | 6 | 13 | 9 | 7 |
| 8 | 6 | 13 | 9 | 7 |
| 9 | 6 | 14 | 9 | 8 |
| 9 | 6 | 14 | 9 | 8 |

## Table 6-9
## Total Vehicle Delay Over the AM Peak Period
## Entering Toll Plaza Lanes - Weekday Traffic Levels in 2012
### Comparison of Toll Plaza Operations between Scenarios 1, 6, 9, 15 and 20
### Pennsylvania Turnpike Value Pricing Study

| | Total Vehicle Delay in Minutes By Plaza | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Scenario** | Pittsburgh Int. 6/57 | New Stanton Int. 8/75 | Valley Forge Int. 24/326 | Mid-County Int. 25A/20 | Fort Washington Int. 26/339 | Willow Grove Int. 27/343 | Philadelphia Int. 28/351 | Lehigh Valley Int. 33/56 |
| Base | 9,032 | 350 | 1,569 | 920 | 39,961 | 49,803 | 48,993 | 437 |
| Scenario 1, Rate 1 | 2,042 | 329 | 1,151 | 726 | 13,226 | 8,883 | 17,654 | 408 |
| Scenario 1, Rate 3 | 1,487 | 322 | 856 | 685 | 7,026 | 4,859 | 8,179 | 405 |
| Scenario 6, Rate 1 | 1,600 | 306 | 859 | 719 | 11,520 | 8,734 | 15,033 | 390 |
| Scenario 6, Rate 3 | 1,214 | 301 | 779 | 668 | 5,195 | 5,422 | 7,861 | 365 |
| Scenario 9, Rate 1 | 2,225 | 326 | 1,080 | 755 | 16,878 | 14,583 | 22,942 | 412 |
| Scenario 9, Rate 2 | 1,609 | 317 | 922 | 683 | 9,055 | 6,172 | 9,048 | 401 |
| Scenario 15, Rate 1 | 3,143 | 349 | 1,280 | 787 | 27,993 | 32,431 | 33,627 | 425 |
| Scenario 15, Rate 2 | 1,894 | 345 | 1,033 | 766 | 24,006 | 25,014 | 32,621 | 410 |
| Scenario 20, Rate 2 | 8,898 | 350 | 1,539 | 915 | 39,626 | 46,636 | 47,412 | 436 |
| Scenario 20, Rate 3 | 7,946 | 347 | 1,463 | 850 | 37,093 | 43,792 | 44,800 | 433 |

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## Table 6-10
## Total Vehicle Delay Over the PM Peak Period
## Entering Toll Plaza Lanes - Weekday Traffic Levels in 2012
### Comparison of Toll Plaza Operations between Scenarios 1, 6, 9, 15 and 20
### Pennsylvania Turnpike Value Pricing Study

| | Total Vehicle Delay in Minutes By Plaza | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Scenario** | Pittsburgh Int. 6/57 | New Stanton Int. 8/75 | Valley Forge Int. 24/326 | Mid-County Int. 25A/20 | Fort Washington Int. 26/339 | Willow Grove Int. 27/343 | Philadelphia Int. 28/351 | Lehigh Valley Int. 33/56 |
| Base | 37,821 | 324 | 621 | 40,667 | 7,324 | 41,157 | 4,200 | 503 |
| Scenario 1, Rate 1 | 6,714 | 290 | 541 | 5,392 | 904 | 11,869 | 1,121 | 464 |
| Scenario 1, Rate 3 | 1,346 | 281 | 523 | 2,346 | 714 | 2,062 | 1,022 | 436 |
| Scenario 6, Rate 1 | 4,277 | 276 | 515 | 6,878 | 966 | 9,405 | 1,105 | 420 |
| Scenario 6, Rate 3 | 868 | 269 | 484 | 2,623 | 693 | 1,843 | 952 | 399 |
| Scenario 9, Rate 1 | 13,465 | 287 | 558 | 8,224 | 1,331 | 10,871 | 1,067 | 453 |
| Scenario 9, Rate 2 | 1,592 | 283 | 523 | 3,287 | 856 | 2,940 | 1,019 | 448 |
| Scenario 15, Rate 1 | 23,930 | 297 | 600 | 16,784 | 2,389 | 19,983 | 1,098 | 449 |
| Scenario 15, Rate 2 | 15,395 | 290 | 585 | 12,655 | 1,349 | 10,298 | 942 | 443 |
| Scenario 20, Rate 2 | 37,711 | 314 | 600 | 37,325 | 5,967 | 39,159 | 3,126 | 495 |
| Scenario 20, Rate 3 | 35,290 | 310 | 595 | 32,946 | 5,261 | 38,085 | 2,124 | 485 |

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**Table 6-11**
**Average Vehicle Delay by Payment Type Over the AM Peak Period**
**Exiting Toll Plaza Lanes - Weekday Traffic Levels in 2012**
**Comparison of Toll Plaza Operations between Scenarios 1, 6, 9, 15 and 20**
**Pennsylvania Turnpike Value Pricing Study**

**Pittsburgh Plaza**
**Interchange 6/57**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 92 | 20 | 105 | 22 | 66 |
| Scenario 1, Rate 1 | 24 | 7 | 42 | 9 | 18 |
| Scenario 1, Rate 3 | 20 | 6 | 36 | 10 | 16 |
| Scenario 6, Rate 1 | 24 | 7 | 42 | 9 | 18 |
| Scenario 6, Rate 3 | 20 | 6 | 36 | 10 | 16 |
| Scenario 9, Rate 1 | 20 | 7 | 34 | 10 | 16 |
| Scenario 9, Rate 2 | 20 | 6 | 33 | 10 | 15 |
| Scenario 15, Rate 1 | 21 | 8 | 38 | 11 | 16 |
| Scenario 15, Rate 2 | 19 | 7 | 34 | 11 | 14 |
| Scenario 20, Rate 2 | 45 | 14 | 67 | 18 | 33 |
| Scenario 20, Rate 3 | 41 | 11 | 55 | 16 | 30 |

**New Stanton**
**Interchange 8/75**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 21 | 4 | 36 | 8 | 17 |
| 21 | 4 | 35 | 7 | 17 |
| 20 | 4 | 35 | 8 | 17 |
| 21 | 4 | 35 | 7 | 17 |
| 20 | 4 | 35 | 8 | 17 |
| 21 | 4 | 33 | 8 | 17 |
| 21 | 4 | 35 | 7 | 17 |
| 21 | 4 | 36 | 8 | 16 |
| 20 | 4 | 35 | 8 | 15 |
| 21 | 4 | 36 | 8 | 17 |
| 21 | 4 | 35 | 8 | 17 |

**Valley Forge**
**Interchange 24/326**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 92 | 21 | 108 | 25 | 48 |
| Scenario 1, Rate 1 | 27 | 6 | 42 | 10 | 15 |
| Scenario 1, Rate 3 | 25 | 6 | 42 | 9 | 14 |
| Scenario 6, Rate 1 | 25 | 6 | 42 | 10 | 15 |
| Scenario 6, Rate 3 | 25 | 6 | 42 | 9 | 14 |
| Scenario 9, Rate 1 | 24 | 6 | 41 | 9 | 13 |
| Scenario 9, Rate 2 | 23 | 6 | 39 | 9 | 13 |
| Scenario 15, Rate 1 | 23 | 8 | 37 | 11 | 13 |
| Scenario 15, Rate 2 | 23 | 8 | 38 | 12 | 13 |
| Scenario 20, Rate 2 | 79 | 19 | 87 | 21 | 35 |
| Scenario 20, Rate 3 | 49 | 14 | 66 | 17 | 27 |

**Mid-County**
**Interchange 25A/20**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 22 | 7 | 37 | 10 | 14 |
| 19 | 5 | 34 | 8 | 11 |
| 17 | 5 | 32 | 8 | 11 |
| 19 | 5 | 34 | 8 | 11 |
| 17 | 5 | 32 | 8 | 11 |
| 20 | 5 | 34 | 8 | 12 |
| 19 | 5 | 33 | 8 | 11 |
| 19 | 5 | 33 | 9 | 11 |
| 17 | 5 | 31 | 9 | 10 |
| 22 | 7 | 37 | 10 | 14 |
| 20 | 7 | 36 | 10 | 13 |

**Fort Washington**
**Interchange 26/339**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 82 | 41 | 101 | 40 | 58 |
| Scenario 1, Rate 1 | 30 | 6 | 50 | 10 | 17 |
| Scenario 1, Rate 3 | 21 | 5 | 39 | 9 | 13 |
| Scenario 6, Rate 1 | 30 | 6 | 50 | 10 | 17 |
| Scenario 6, Rate 3 | 21 | 5 | 39 | 9 | 13 |
| Scenario 9, Rate 1 | 27 | 6 | 47 | 9 | 15 |
| Scenario 9, Rate 2 | 26 | 5 | 46 | 9 | 15 |
| Scenario 15, Rate 1 | 28 | 8 | 47 | 11 | 15 |
| Scenario 15, Rate 2 | 20 | 7 | 38 | 10 | 12 |
| Scenario 20, Rate 2 | 57 | 26 | 74 | 30 | 39 |
| Scenario 20, Rate 3 | 49 | 22 | 63 | 27 | 32 |

**Willow Grove**
**Interchange 27/343**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 377 | 71 | 611 | 78 | 197 |
| 112 | 47 | 162 | 57 | 77 |
| 79 | 39 | 90 | 35 | 57 |
| 112 | 47 | 162 | 57 | 77 |
| 79 | 39 | 90 | 35 | 57 |
| 104 | 48 | 112 | 52 | 71 |
| 54 | 27 | 61 | 33 | 39 |
| 97 | 45 | 117 | 50 | 63 |
| 101 | 48 | 93 | 55 | 65 |
| 347 | 67 | 482 | 69 | 177 |
| 338 | 56 | 192 | 58 | 154 |

**Philadelphia**
**Interchange 28/351**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 29 | 9 | 36 | 11 | 17 |
| Scenario 1, Rate 1 | 16 | 6 | 23 | 8 | 10 |
| Scenario 1, Rate 3 | 16 | 5 | 22 | 8 | 10 |
| Scenario 6, Rate 1 | 16 | 6 | 23 | 8 | 10 |
| Scenario 6, Rate 3 | 16 | 5 | 22 | 8 | 10 |
| Scenario 9, Rate 1 | 17 | 6 | 23 | 9 | 11 |
| Scenario 9, Rate 2 | 16 | 6 | 22 | 9 | 10 |
| Scenario 15, Rate 1 | 17 | 6 | 22 | 9 | 10 |
| Scenario 15, Rate 2 | 16 | 6 | 22 | 9 | 10 |
| Scenario 20, Rate 2 | 25 | 9 | 32 | 11 | 15 |
| Scenario 20, Rate 3 | 19 | 7 | 26 | 10 | 12 |

**Lehigh Valley**
**Interchange 33/56**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 23 | 5 | 38 | 8 | 16 |
| 21 | 4 | 33 | 8 | 15 |
| 20 | 4 | 34 | 7 | 14 |
| 21 | 4 | 33 | 8 | 15 |
| 20 | 4 | 34 | 7 | 14 |
| 21 | 4 | 35 | 8 | 14 |
| 20 | 4 | 34 | 8 | 14 |
| 20 | 5 | 34 | 8 | 13 |
| 20 | 5 | 33 | 8 | 12 |
| 23 | 5 | 37 | 8 | 16 |
| 18 | 4 | 31 | 8 | 13 |

**Table 6-12**
**Average Vehicle Delay by Payment Type Over the PM Peak Period**
**Exiting Toll Plaza Lanes - Weekday Traffic Levels in 2012**
**Comparison of Toll Plaza Operations between Scenarios 1, 6, 9, 15 and 20**
**Pennsylvania Turnpike Value Pricing Study**

**Pittsburgh Plaza**
**Interchange 6/57**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 90 | 7 | 105 | 11 | 69 |
| Scenario 1, Rate 1 | 27 | 6 | 54 | 8 | 27 |
| Scenario 1, Rate 3 | 27 | 6 | 41 | 9 | 23 |
| Scenario 6, Rate 1 | 27 | 6 | 54 | 8 | 27 |
| Scenario 6, Rate 3 | 27 | 6 | 41 | 9 | 23 |
| Scenario 9, Rate 1 | 27 | 6 | 45 | 9 | 22 |
| Scenario 9, Rate 2 | 23 | 7 | 42 | 11 | 19 |
| Scenario 15, Rate 1 | 31 | 7 | 48 | 11 | 24 |
| Scenario 15, Rate 2 | 26 | 7 | 40 | 10 | 20 |
| Scenario 20, Rate 2 | 82 | 7 | 97 | 11 | 62 |
| Scenario 20, Rate 3 | 66 | 7 | 92 | 10 | 51 |

**New Stanton**
**Interchange 8/75**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 36 | 8 | 54 | 12 | 30 |
| 25 | 7 | 42 | 11 | 22 |
| 25 | 7 | 40 | 10 | 21 |
| 25 | 7 | 42 | 11 | 22 |
| 25 | 7 | 40 | 10 | 21 |
| 25 | 6 | 42 | 10 | 21 |
| 25 | 7 | 41 | 10 | 21 |
| 24 | 8 | 42 | 11 | 20 |
| 25 | 7 | 44 | 11 | 20 |
| 29 | 8 | 43 | 11 | 23 |
| 28 | 8 | 43 | 11 | 23 |

**Valley Forge**
**Interchange 24/326**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 24 | 4 | 47 | 8 | 15 |
| Scenario 1, Rate 1 | 23 | 4 | 44 | 8 | 15 |
| Scenario 1, Rate 3 | 23 | 4 | 45 | 8 | 14 |
| Scenario 6, Rate 1 | 23 | 4 | 44 | 8 | 15 |
| Scenario 6, Rate 3 | 23 | 4 | 45 | 8 | 14 |
| Scenario 9, Rate 1 | 23 | 4 | 41 | 8 | 13 |
| Scenario 9, Rate 2 | 23 | 4 | 43 | 8 | 14 |
| Scenario 15, Rate 1 | 23 | 4 | 44 | 8 | 13 |
| Scenario 15, Rate 2 | 22 | 4 | 42 | 8 | 12 |
| Scenario 20, Rate 2 | 24 | 4 | 44 | 8 | 15 |
| Scenario 20, Rate 3 | 24 | 4 | 44 | 8 | 14 |

**Mid-County**
**Interchange 25A/20**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 19 | 5 | 33 | 8 | 12 |
| 17 | 5 | 32 | 8 | 11 |
| 17 | 5 | 30 | 8 | 10 |
| 17 | 5 | 32 | 8 | 11 |
| 17 | 5 | 30 | 8 | 10 |
| 17 | 5 | 31 | 8 | 11 |
| 17 | 5 | 33 | 8 | 10 |
| 17 | 5 | 33 | 8 | 11 |
| 17 | 5 | 31 | 8 | 10 |
| 18 | 5 | 33 | 8 | 12 |
| 17 | 5 | 33 | 8 | 12 |

**Fort Washington**
**Interchange 26/339**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 46 | 19 | 62 | 23 | 31 |
| Scenario 1, Rate 1 | 19 | 7 | 38 | 10 | 12 |
| Scenario 1, Rate 3 | 18 | 7 | 39 | 11 | 12 |
| Scenario 6, Rate 1 | 19 | 7 | 38 | 10 | 12 |
| Scenario 6, Rate 3 | 18 | 7 | 39 | 11 | 12 |
| Scenario 9, Rate 1 | 19 | 7 | 38 | 11 | 12 |
| Scenario 9, Rate 2 | 20 | 8 | 41 | 12 | 13 |
| Scenario 15, Rate 1 | 22 | 9 | 40 | 12 | 14 |
| Scenario 15, Rate 2 | 17 | 8 | 38 | 10 | 11 |
| Scenario 20, Rate 2 | 36 | 15 | 55 | 20 | 24 |
| Scenario 20, Rate 3 | 29 | 12 | 45 | 19 | 19 |

**Willow Grove**
**Interchange 27/343**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 74 | 40 | 85 | 41 | 55 |
| 20 | 9 | 36 | 13 | 14 |
| 18 | 8 | 35 | 11 | 13 |
| 20 | 9 | 36 | 13 | 14 |
| 18 | 8 | 35 | 11 | 13 |
| 19 | 8 | 34 | 10 | 13 |
| 17 | 7 | 33 | 10 | 12 |
| 24 | 12 | 36 | 15 | 16 |
| 20 | 10 | 36 | 13 | 13 |
| 72 | 29 | 85 | 23 | 45 |
| 67 | 14 | 84 | 17 | 36 |

**Philadelphia**
**Interchange 28/351**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| **Condition** | PC Cash | PC ETC | CV Cash | CV ETC | All |
| Base | 27 | 5 | 34 | 9 | 16 |
| Scenario 1, Rate 1 | 18 | 5 | 25 | 8 | 12 |
| Scenario 1, Rate 3 | 18 | 5 | 25 | 8 | 12 |
| Scenario 6, Rate 1 | 18 | 5 | 25 | 8 | 12 |
| Scenario 6, Rate 3 | 18 | 5 | 25 | 8 | 12 |
| Scenario 9, Rate 1 | 18 | 5 | 24 | 9 | 11 |
| Scenario 9, Rate 2 | 17 | 5 | 24 | 8 | 11 |
| Scenario 15, Rate 1 | 17 | 5 | 26 | 9 | 10 |
| Scenario 15, Rate 2 | 16 | 5 | 24 | 9 | 10 |
| Scenario 20, Rate 2 | 23 | 5 | 28 | 9 | 14 |
| Scenario 20, Rate 3 | 17 | 5 | 25 | 9 | 11 |

**Lehigh Valley**
**Interchange 33/56**

| | Average Vehicle Delay in Seconds | | | | |
|---|---|---|---|---|---|
| PC Cash | PC ETC | CV Cash | CV ETC | All |
| 35 | 5 | 48 | 8 | 23 |
| 24 | 5 | 38 | 8 | 17 |
| 23 | 4 | 36 | 8 | 16 |
| 24 | 5 | 38 | 8 | 17 |
| 23 | 4 | 36 | 8 | 16 |
| 24 | 4 | 37 | 8 | 16 |
| 23 | 4 | 38 | 8 | 16 |
| 27 | 5 | 39 | 8 | 17 |
| 21 | 5 | 36 | 8 | 14 |
| 34 | 5 | 45 | 8 | 21 |
| 28 | 5 | 41 | 8 | 18 |

## Table 6-13
## Total Vehicle Delay Over the AM Peak Period
## Exiting Toll Plaza Lanes - Weekday Traffic Levels in 2012
### Comparison of Toll Plaza Operations between Scenarios 1, 6, 9,15 and 20
### Pennsylvania Turnpike Value Pricing Study

| | Total Vehicle Delay in Minutes By Plaza | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Scenario** | Pittsburgh Int. 6/57 | New Stanton Int. 8/75 | Valley Forge Int. 24/326 | Mid-County Int. 25A/20 | Fort Washington Int. 26/339 | Willow Grove Int. 27/343 | Philadelphia Int. 28/351 | Lehigh Valley Int. 33/56 |
| Base | 4,979 | 595 | 7,289 | 2,299 | 5,218 | 21,101 | 2,627 | 933 |
| Scenario 1, Rate 1 | 1,187 | 526 | 1,954 | 1,614 | 1,270 | 7,393 | 1,310 | 752 |
| Scenario 1, Rate 3 | 961 | 511 | 1,727 | 1,429 | 915 | 5,169 | 1,181 | 702 |
| Scenario 6, Rate 1 | 1,187 | 526 | 1,954 | 1,614 | 1,270 | 7,393 | 1,310 | 752 |
| Scenario 6, Rate 3 | 961 | 511 | 1,727 | 1,429 | 915 | 5,169 | 1,181 | 702 |
| Scenario 9, Rate 1 | 1,057 | 536 | 1,807 | 1,748 | 1,191 | 7,081 | 1,484 | 762 |
| Scenario 9, Rate 2 | 953 | 505 | 1,631 | 1,550 | 1,077 | 3,641 | 1,192 | 702 |
| Scenario 15, Rate 1 | 1,130 | 564 | 1,937 | 1,723 | 1,341 | 6,942 | 1,491 | 764 |
| Scenario 15, Rate 2 | 1,012 | 523 | 1,903 | 1,522 | 1,013 | 7,121 | 1,394 | 696 |
| Scenario 20, Rate 2 | 2,539 | 592 | 5,084 | 2,227 | 3,491 | 19,104 | 2,365 | 914 |
| Scenario 20, Rate 3 | 2,278 | 587 | 3,979 | 2,174 | 3,342 | 18,796 | 1,832 | 754 |

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## Table 6-14
## Total Vehicle Delay Over the PM Peak Period
## Exiting Toll Plaza Lanes - Weekday Traffic Levels in 2012
### Comparison of Toll Plaza Operations between Scenarios 1, 6, 9, 15 and 20
### Pennsylvania Turnpike Value Pricing Study

| | Total Vehicle Delay in Minutes By Plaza | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Scenario** | Pittsburgh Int. 6/57 | New Stanton Int. 8/75 | Valley Forge Int. 24/326 | Mid-County Int. 25A/20 | Fort Washington Int. 26/339 | Willow Grove Int. 27/343 | Philadelphia Int. 28/351 | Lehigh Valley Int. 33/56 |
| Base | 5,170 | 1,545 | 1,313 | 1,495 | 2,678 | 5,867 | 1,980 | 1,492 |
| Scenario 1, Rate 1 | 1,820 | 998 | 1,138 | 1,126 | 902 | 1,296 | 1,262 | 989 |
| Scenario 1, Rate 3 | 1,485 | 927 | 1,043 | 1,011 | 806 | 1,103 | 1,139 | 898 |
| Scenario 6, Rate 1 | 1,820 | 998 | 1,138 | 1,126 | 902 | 1,296 | 1,262 | 989 |
| Scenario 6, Rate 3 | 1,485 | 927 | 1,043 | 1,011 | 806 | 1,103 | 1,139 | 898 |
| Scenario 9, Rate 1 | 1,500 | 962 | 1,087 | 1,139 | 915 | 1,273 | 1,228 | 945 |
| Scenario 9, Rate 2 | 1,284 | 951 | 1,039 | 1,054 | 931 | 1,069 | 1,119 | 892 |
| Scenario 15, Rate 1 | 1,736 | 1,005 | 1,178 | 1,252 | 1,146 | 1,740 | 1,234 | 1,056 |
| Scenario 15, Rate 2 | 1,424 | 1,001 | 1,025 | 1,184 | 930 | 1,399 | 1,052 | 862 |
| Scenario 20, Rate 2 | 4,697 | 1,214 | 1,306 | 1,463 | 2,046 | 5,228 | 1,714 | 1,337 |
| Scenario 20, Rate 3 | 3,787 | 1,201 | 1,224 | 1,445 | 1,633 | 3,891 | 1,358 | 1,159 |

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**Table 6-15**

## Estimated Mainline Segment Level of Service for a Typical AM Weekday Peak Hour in 2002

Pennsylvania Turnpike Value Pricing Study

| Mainline Segment | Base | Scenarios 1,3,17-1 | | Scenario 6 | | Scenarios 9,17-9 | | Scenario 15 | | Scenario 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate 1 | Rate 3 | Rate 1 | Rate 3 | Rate 1 | Rate 2 | Rate 1 | Rate 2 | Rate 2 | Rate 3 |
| **Westbound Direction (1)** | | | | | | | | | | | |
| Pittsburgh | | | | | | | | | | | |
| 4-5 | B | B | B | B | B | B | B | B | B | B | B |
| 5-6 | C | C | C | C | C | C | C | C | C | C | C |
| 6-7 | C | B | B | B | B | C | B | C | C | C | C |
| 7-8 | C | B | B | B | B | B | B | C | C | C | C |
| Philadelphia | | | | | | | | | | | |
| 23-24 | B | B | B | B | B | B | B | B | B | B | B |
| 24-25 | C | C | C | C | C | C | C | C | C | C | C |
| 25-25A | C | C | C | C | C | C | C | C | C | C | C |
| 25A-26 | E | D | D | D | D | D | D | E | E | E | E |
| 26-27 | D | D | C | D | C | D | C | D | D | D | D |
| 27-28 | D | C | C | C | C | C | C | D | D | D | D |
| 28-29 | B | B | B | B | B | B | B | B | B | B | B |
| 29-30 | B | B | B | B | B | B | B | B | B | B | B |
| NE Extension | | | | | | | | | | | |
| 25A-31 | B | B | B | B | B | B | B | B | B | B | B |
| 31-32 | B | B | B | B | B | B | B | B | B | B | B |
| 32-33 | B | A | A | A | A | B | A | B | B | B | B |
| **Eastbound Direction (2)** | | | | | | | | | | | |
| Pittsburgh | | | | | | | | | | | |
| 4-5 | B | B | A | B | A | B | B | B | B | B | B |
| 5-6 | B | B | B | B | B | B | B | B | B | B | B |
| 6-7 | B | B | B | B | B | B | B | B | B | B | B |
| 7-8 | B | B | B | B | B | B | B | B | B | B | B |
| Philadelphia | | | | | | | | | | | |
| 23-24 | C | C | C | C | C | C | C | C | C | C | C |
| 24-25 | D | C | C | C | C | C | C | C | C | C | C |
| 25-25A | C | B | B | B | B | B | B | B | B | C | B |
| 25A-26 | D | C | C | C | C | C | C | D | D | D | D |
| 26-27 | D | C | C | C | C | C | C | C | C | D | D |
| 27-28 | C | C | B | C | B | C | B | C | C | C | C |
| 28-29 | B | A | A | A | A | A | A | B | B | B | B |
| 29-30 | B | A | A | A | A | A | A | B | B | B | B |
| NE Extension | | | | | | | | | | | |
| 25A-31 | D | C | C | C | C | C | C | C | C | D | D |
| 31-32 | C | C | C | C | C | C | C | C | C | C | C |
| 32-33 | C | C | C | C | B | C | C | C | C | C | C |

(1) On the Northeastern Extension, the values shown here are for the northbound direction.
(2) On the Northeastern Extension, the values shown here are for the southbound direction.

**Table 6-16**

## Estimated Mainline Segment Level of Service for a Typical PM Weekday Peak Hour in 2002

Pennsylvania Turnpike Value Pricing Study

| Mainline Segment | Base | Scenarios 1,3,17-1 | | Scenario 6 | | Scenarios 9,17-9 | | Scenario 15 | | Scenario 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate 1 | Rate 3 | Rate 1 | Rate 3 | Rate 1 | Rate 2 | Rate 1 | Rate 2 | Rate 2 | Rate 3 |
| **Westbound Direction (1)** | | | | | | | | | | | |
| Pittsburgh | | | | | | | | | | | |
| 4-5 | B | B | B | B | B | B | B | B | B | B | B |
| 5-6 | C | B | B | B | B | B | B | C | B | C | C |
| 6-7 | C | B | B | B | B | B | B | B | B | C | C |
| 7-8 | B | B | B | B | B | B | B | B | B | B | B |
| Philadelphia | | | | | | | | | | | |
| 23-24 | C | C | C | C | C | C | C | C | C | C | C |
| 24-25 | C | C | C | C | C | C | C | C | C | C | C |
| 25-25A | B | B | B | B | B | B | B | B | B | B | B |
| 25A-26 | D | D | C | C | C | D | C | D | D | D | D |
| 26-27 | C | C | C | C | C | C | C | C | C | C | C |
| 27-28 | C | C | B | C | B | C | C | C | C | C | C |
| 28-29 | C | B | B | B | B | B | B | C | B | C | C |
| 29-30 | C | B | B | B | B | B | B | B | B | B | B |
| NE Extension | | | | | | | | | | | |
| 25A-31 | D | C | C | C | C | C | C | C | C | D | D |
| 31-32 | C | C | C | C | C | C | C | C | C | C | C |
| 32-33 | C | C | B | C | B | C | C | C | C | C | C |
| **Eastbound Direction (2)** | | | | | | | | | | | |
| Pittsburgh | | | | | | | | | | | |
| 4-5 | C | B | B | B | B | B | B | B | B | C | C |
| 5-6 | C | C | C | C | C | C | C | C | C | C | C |
| 6-7 | C | C | C | C | C | C | C | C | C | C | C |
| 7-8 | C | B | B | B | B | B | B | B | B | C | B |
| Philadelphia | | | | | | | | | | | |
| 23-24 | B | B | B | B | B | B | B | B | B | B | B |
| 24-25 | C | C | C | C | C | C | C | C | C | C | C |
| 25-25A | C | C | C | C | C | C | C | C | C | C | C |
| 25A-26 | D | D | D | D | C | D | D | D | D | D | D |
| 26-27 | D | C | C | C | C | D | D | D | D | D | D |
| 27-28 | D | C | C | C | C | C | C | C | C | D | D |
| 28-29 | A | A | A | A | A | A | A | A | A | A | A |
| 29-30 | A | A | A | A | A | A | A | A | A | A | A |
| NE Extension | | | | | | | | | | | |
| 25A-31 | C | B | B | B | B | B | B | B | B | B | B |
| 31-32 | B | B | B | B | B | B | B | B | B | B | B |
| 32-33 | B | B | A | A | A | B | A | B | B | B | B |

(1) On the Northeastern Extension, the values shown here are for the northbound direction.
(2) On the Northeastern Extension, the values shown here are for the southbound direction.

**Table 6-17**

## Estimated Mainline Segment Level of Service for a Typical AM Weekday Peak Hour in 2012

Pennsylvania Turnpike Value Pricing Study

| Mainline Segment | Base | Scenarios 1,3,17-1 | | Scenario 6 | | Scenarios 9,17-9 | | Scenario 15 | | Scenario 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate 1 | Rate 3 | Rate 1 | Rate 3 | Rate 1 | Rate 2 | Rate 1 | Rate 2 | Rate 2 | Rate 3 |
| **Westbound Direction (1)** | | | | | | | | | | | |
| Pittsburgh | | | | | | | | | | | |
| 4-5 | C | C | C | C | C | C | C | C | C | C | C |
| 5-6 | D | D | C | D | C | D | C | D | D | D | D |
| 6-7 | C | C | C | C | C | C | C | C | C | C | C |
| 7-8 | C | C | C | C | C | C | C | C | C | C | C |
| Philadelphia | | | | | | | | | | | |
| 23-24 | C | B | B | B | B | B | B | C | C | C | C |
| 24-25 | D | D | C | D | C | D | D | D | D | D | D |
| 25-25A | D | D | C | C | C | D | C | D | D | D | D |
| 25A-26 | F | F | F | F | F | F | F | F | F | F | F |
| 26-27 | F | E | E | E | E | E | E | F | F | F | F |
| 27-28 | E | D | D | D | D | D | D | E | E | E | E |
| 28-29 | C | B | B | B | B | C | B | C | C | C | C |
| 29-30 | C | B | B | B | B | C | B | C | C | C | C |
| NE Extension | | | | | | | | | | | |
| 25A-31 | C | C | C | C | C | C | C | C | C | C | C |
| 31-32 | C | C | C | C | C | C | C | C | C | C | C |
| 32-33 | B | B | B | B | B | B | B | B | B | B | B |
| **Eastbound Direction (2)** | | | | | | | | | | | |
| Pittsburgh | | | | | | | | | | | |
| 4-5 | B | B | B | B | B | B | B | B | B | B | B |
| 5-6 | C | C | B | B | B | C | B | C | C | C | C |
| 6-7 | C | B | B | B | B | B | B | C | C | C | C |
| 7-8 | B | B | B | B | B | B | B | B | B | B | B |
| Philadelphia | | | | | | | | | | | |
| 23-24 | E | D | D | D | D | D | D | D | D | E | D |
| 24-25 | E | D | D | D | D | D | D | E | E | E | E |
| 25-25A | C | C | C | C | C | C | C | C | C | C | C |
| 25A-26 | F | D | D | D | D | E | D | F | F | F | F |
| 26-27 | E | D | D | D | D | D | D | E | E | E | E |
| 27-28 | D | C | C | C | C | C | C | D | D | D | D |
| 28-29 | B | B | B | B | B | B | B | B | B | B | B |
| 29-30 | B | B | B | B | B | B | B | B | B | B | B |
| NE Extension | | | | | | | | | | | |
| 25A-31 | F | D | D | D | D | D | D | E | E | F | F |
| 31-32 | D | D | D | D | D | D | D | D | D | D | D |
| 32-33 | D | D | C | C | C | D | C | D | D | D | D |

(1) On the Northeastern Extension, the values shown here are for the northbound direction.
(2) On the Northeastern Extension, the values shown here are for the southbound direction.

**Table 6-18**

## Estimated Mainline Segment Level of Service for a Typical PM Weekday Peak Hour in 2012

Pennsylvania Turnpike Value Pricing Study

| Mainline Segment | Base | Scenarios 1,3,17-1 | | Scenario 6 | | Scenarios 9,17-9 | | Scenario 15 | | Scenario 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate 1 | Rate 3 | Rate 1 | Rate 3 | Rate 1 | Rate 2 | Rate 1 | Rate 2 | Rate 2 | Rate 3 |
| **Westbound Direction (1)** | | | | | | | | | | | |
| Pittsburgh | | | | | | | | | | | |
| 4-5 | C | C | C | C | B | C | C | C | C | C | C |
| 5-6 | C | C | C | C | C | C | C | C | C | C | C |
| 6-7 | C | C | C | C | C | C | C | C | C | C | C |
| 7-8 | C | C | C | C | C | C | C | C | C | C | C |
| Philadelphia | | | | | | | | | | | |
| 23-24 | E | D | D | D | D | E | D | E | E | E | E |
| 24-25 | E | D | D | D | D | E | D | E | E | E | E |
| 25-25A | C | C | C | C | C | C | C | C | C | C | C |
| 25A-26 | F | E | E | E | E | E | E | F | F | F | F |
| 26-27 | E | D | D | D | D | D | D | E | E | E | E |
| 27-28 | D | C | C | C | C | C | C | D | D | D | D |
| 28-29 | C | C | C | C | C | C | C | C | C | C | C |
| 29-30 | C | C | C | C | C | C | C | C | C | C | C |
| NE Extension | | | | | | | | | | | |
| 25A-31 | F | E | D | E | D | E | E | E | E | F | F |
| 31-32 | E | D | D | D | D | D | D | E | D | E | E |
| 32-33 | D | C | C | C | C | C | C | D | D | D | D |
| **Eastbound Direction (2)** | | | | | | | | | | | |
| Pittsburgh | | | | | | | | | | | |
| 4-5 | C | C | C | C | C | C | C | C | C | C | C |
| 5-6 | D | D | C | D | C | D | D | D | D | D | D |
| 6-7 | D | D | D | D | C | D | D | D | D | D | D |
| 7-8 | C | C | C | C | C | C | C | C | C | C | C |
| Philadelphia | | | | | | | | | | | |
| 23-24 | C | C | C | C | C | C | C | C | C | C | C |
| 24-25 | E | D | D | D | D | D | D | D | D | E | E |
| 25-25A | E | D | D | D | D | D | D | D | D | E | E |
| 25A-26 | F | F | E | F | E | F | E | F | F | F | F |
| 26-27 | F | E | E | E | D | E | E | F | F | F | F |
| 27-28 | E | D | D | D | D | D | D | E | E | E | E |
| 28-29 | B | B | A | A | A | B | A | B | B | B | B |
| 29-30 | B | A | A | A | A | B | A | B | B | B | B |
| NE Extension | | | | | | | | | | | |
| 25A-31 | C | C | C | C | C | C | C | C | C | C | C |
| 31-32 | C | B | B | B | B | C | B | C | C | C | C |
| 32-33 | B | B | B | B | B | B | B | B | B | B | B |

(1) On the Northeastern Extension, the values shown here are for the northbound direction.
(2) On the Northeastern Extension, the values shown here are for the southbound direction.

**Table 6-19**

## Estimated Value Pricing Impacts of Diverted Turnpike Traffic on Alternative Routes

**AM Peak Hour: Westbound and Northbound Directions**

| Segment | | | | Scenario 1 | | Scenario 6 | | Scenario 9 | | Scenario 15 | | Scenario 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Name | Between | | Rate 1 | Rate 3 | Rate 1 | Rate 3 | Rate 1 | Rate 2 | Rate 1 | Rate 2 | Rate 2 | Rate 3 |
| | | | **Screenline 1** | | | | | | | | | | |
| 1 | Rt. 1 | Rt. 202 | Rt. 252 | 20 | 20 | 20 | 30 | 10 | 20 | 10 | 10 | 0 | 0 |
| 2 | Rt. 3 | Rt. 202 | Rt. 252 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Rt. 30 | Rt. 202 | Rt. 252 | 30 | 40 | 40 | 50 | 30 | 30 | 20 | 20 | 0 | 10 |
| **4** | **Pennsylvania Turnpike** | **Interchange 23** | **Interchange 24** | **-50** | **-60** | **-70** | **-90** | **-40** | **-60** | **-30** | **-40** | **-10** | **-20** |
| 5 | Rt. 23 | Rt. 100 | Rt. 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Rt. 422 | Rt. 100 | Rt. 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | Rt. 73 | Rt. 663 | Rt. 29 | 0 | 0 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | **Screenline 2** | | | | | | | | | | |
| 8 | I 95 | Rt. 70 | Rt. 73 | 120 | 160 | 130 | 170 | 100 | 140 | 60 | 80 | 10 | 20 |
| 9 | Rt. 1 | Rt. 611 | Rt. 232 | 30 | 40 | 40 | 50 | 30 | 40 | 20 | 20 | 0 | 0 |
| 10 | Rt. 73 | Rt. 611 | Rt. 309 | 60 | 80 | 60 | 80 | 50 | 60 | 30 | 40 | 10 | 10 |
| **11** | **Pennsylvania Turnpike** | **Interchange 26** | **Interchange 27** | **-360** | **-460** | **-380** | **-480** | **-290** | **-400** | **-190** | **-240** | **-30** | **-60** |
| 12 | Rt. 63 | Rt. 202 | PA TPK | 50 | 70 | 60 | 70 | 40 | 60 | 30 | 40 | 0 | 10 |
| 13 | Rt. 202 | Rt. 611 | Rt. 63 | 60 | 80 | 60 | 80 | 50 | 60 | 30 | 40 | 10 | 10 |
| | | | **Screenline 3** | | | | | | | | | | |
| 14 | I-295 | Rt. 73 | PA TPK | 30 | 40 | 30 | 40 | 20 | 30 | 10 | 20 | 0 | 0 |
| **15** | **Pennsylvania Turnpike** | **Interchange 29** | **Interchange 30** | **-170** | **-220** | **-180** | **-220** | **-140** | **-180** | **-80** | **-100** | **-10** | **-20** |
| 16 | I 95 | Rt. 32 | Rt. 31 | 90 | 120 | 100 | 120 | 80 | 100 | 40 | 50 | 0 | 10 |
| 17 | Rt. 202 | Rt. 32 | Rt. 31 | 30 | 40 | 30 | 50 | 30 | 40 | 20 | 20 | 10 | 10 |
| | | | **Screenline 4** | | | | | | | | | | |
| 18 | Rt. 29 | Rt 73 | Rt. 63 | 20 | 20 | 20 | 30 | 10 | 20 | 10 | 10 | 0 | 0 |
| 19 | Rt. 63 | Rt. 29 | PA TPK | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 |
| **20** | **Pennsylvania Turnpike** | **Interchange 31** | **Interchange 32** | **-90** | **-120** | **-100** | **-130** | **-70** | **-100** | **-50** | **-60** | **-10** | **-20** |
| 21 | Rt. 309 | Rt. 663 | Rt. 202 | 30 | 30 | 30 | 40 | 20 | 30 | 10 | 20 | 0 | 10 |
| 22 | Rt. 313 | Rt. 563 | Rt. 611 | 10 | 10 | 10 | 20 | 10 | 10 | 10 | 10 | 0 | 0 |
| | | | **Screenline 5** | | | | | | | | | | |
| 23 | Rt. 51 | Rt. 136 | Rt. 70 | 30 | 40 | 30 | 40 | 20 | 30 | 20 | 20 | 0 | 0 |
| **24** | **Pennsylvania Turnpike** | **Interchange 7** | **Interchange 8** | **-100** | **-120** | **-110** | **-130** | **-80** | **-110** | **-60** | **-80** | **-10** | **-10** |
| 25 | Rt. 119 | Rt. 66 | PA TPK | 40 | 60 | 50 | 60 | 40 | 50 | 30 | 40 | 0 | 0 |
| 26 | Rt. 30 | Rt. 119 | Rt. 981 | 20 | 20 | 20 | 30 | 20 | 20 | 10 | 20 | 0 | 10 |
| | | | **Screenline 6** | | | | | | | | | | |
| 27 | Rt. 51 | Rt. 19 | Rt. 837 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 |
| 28 | Rt. 376 | Rt. 51 | Rt. 30 | 50 | 60 | 60 | 70 | 40 | 50 | 30 | 40 | 10 | 10 |
| 29 | Rt. 8 | Rt. 380 | Rt. 376 | 60 | 80 | 70 | 90 | 50 | 80 | 40 | 50 | 0 | 10 |
| **30** | **Pennsylvania Turnpike** | **Interchange 5** | **Interchange 6** | **-120** | **-160** | **-140** | **-170** | **-110** | **-140** | **-80** | **-110** | **-10** | **-20** |

**Table 6-20**

## Estimated Value Pricing Impacts of Diverted Turnpike Traffic on Alternative Routes

**AM Peak Hour: Eastbound and Southbound Directions**

| Segment | | | | Scenario 1 | | Scenario 6 | | Scenario 9 | | Scenario 15 | | Scenario 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Name | Between | | Rate 1 | Rate 3 | Rate 1 | Rate 3 | Rate 1 | Rate 2 | Rate 1 | Rate 2 | Rate 2 | Rate 3 |
| | | | | | | **Screenline 1** | | | | | | | |
| 1 | Rt. 1 | Rt. 202 | Rt. 252 | 20 | 30 | 20 | 30 | 20 | 20 | 10 | 10 | 0 | 0 |
| 2 | Rt. 3 | Rt. 202 | Rt. 252 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 |
| 3 | Rt. 30 | Rt. 202 | Rt. 252 | 70 | 100 | 90 | 130 | 60 | 80 | 30 | 40 | 10 | 20 |
| **4** | **Pennsylvania Turnpike** | **Interchange 23** | **Interchange 24** | **-180** | **-230** | **-210** | **-290** | **-140** | **-190** | **-80** | **-100** | **-20** | **-30** |
| 5 | Rt. 23 | Rt. 100 | Rt. 29 | 40 | 40 | 40 | 60 | 30 | 40 | 20 | 20 | 0 | 0 |
| 6 | Rt. 422 | Rt. 100 | Rt. 29 | 10 | 20 | 20 | 20 | 10 | 20 | 10 | 10 | 0 | 0 |
| 7 | Rt. 73 | Rt. 663 | Rt. 29 | 10 | 20 | 10 | 20 | 10 | 10 | 0 | 0 | 0 | 0 |
| | | | | | | **Screenline 2** | | | | | | | |
| 8 | I 95 | Rt. 70 | Rt. 73 | 140 | 180 | 150 | 210 | 120 | 160 | 70 | 90 | 10 | 20 |
| 9 | Rt. 1 | Rt. 611 | Rt. 232 | 60 | 70 | 60 | 80 | 50 | 60 | 30 | 30 | 0 | 10 |
| 10 | Rt. 73 | Rt. 611 | Rt. 309 | 20 | 30 | 30 | 40 | 20 | 30 | 10 | 20 | 0 | 0 |
| **11** | **Pennsylvania Turnpike** | **Interchange 26** | **Interchange 27** | **-510** | **-630** | **-550** | **-730** | **-420** | **-550** | **-250** | **-310** | **-40** | **-70** |
| 12 | Rt. 63 | Rt. 202 | PA TPK | 110 | 130 | 110 | 150 | 90 | 110 | 50 | 60 | 10 | 10 |
| 13 | Rt. 202 | Rt. 611 | Rt. 63 | 60 | 70 | 60 | 80 | 50 | 60 | 30 | 30 | 10 | 10 |
| | | | | | | **Screenline 3** | | | | | | | |
| 14 | I-295 | Rt. 73 | PA TPK | 10 | 10 | 10 | 10 | 0 | 10 | 0 | 0 | 0 | 0 |
| **15** | **Pennsylvania Turnpike** | **Interchange 29** | **Interchange 30** | **-70** | **-90** | **-80** | **-100** | **-60** | **-80** | **-30** | **-40** | **-10** | **-20** |
| 16 | I 95 | Rt. 32 | Rt. 31 | 40 | 50 | 40 | 50 | 30 | 40 | 20 | 20 | 0 | 10 |
| 17 | Rt. 202 | Rt. 32 | Rt. 31 | 10 | 10 | 10 | 10 | 0 | 10 | 0 | 0 | 0 | 0 |
| | | | | | | **Screenline 4** | | | | | | | |
| 18 | Rt. 29 | Rt 73 | Rt. 63 | 80 | 90 | 80 | 100 | 60 | 80 | 30 | 40 | 10 | 10 |
| 19 | Rt. 63 | Rt. 29 | PA TPK | 20 | 30 | 20 | 30 | 20 | 20 | 10 | 10 | 0 | 0 |
| **20** | **Pennsylvania Turnpike** | **Interchange 31** | **Interchange 32** | **-220** | **-280** | **-250** | **-310** | **-180** | **-240** | **-90** | **-120** | **-20** | **-30** |
| 21 | Rt. 309 | Rt. 663 | Rt. 202 | 70 | 90 | 80 | 100 | 60 | 80 | 30 | 40 | 0 | 10 |
| 22 | Rt. 313 | Rt. 563 | Rt. 611 | 30 | 30 | 30 | 40 | 20 | 30 | 10 | 10 | 0 | 0 |
| | | | | | | **Screenline 5** | | | | | | | |
| 23 | Rt. 51 | Rt. 136 | Rt. 70 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 |
| **24** | **Pennsylvania Turnpike** | **Interchange 7** | **Interchange 8** | **-30** | **-40** | **-40** | **-50** | **-30** | **-30** | **-20** | **-30** | **-10** | **-10** |
| 25 | Rt. 119 | Rt. 66 | PA TPK | 10 | 20 | 20 | 30 | 10 | 20 | 10 | 10 | 0 | 0 |
| 26 | Rt. 30 | Rt. 119 | Rt. 981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | **Screenline 6** | | | | | | | |
| 27 | Rt. 51 | Rt. 19 | Rt. 837 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 10 | 0 | 0 |
| 28 | Rt. 376 | Rt. 51 | Rt. 30 | 30 | 30 | 30 | 40 | 30 | 30 | 20 | 20 | 0 | 0 |
| 29 | Rt. 8 | Rt. 380 | Rt. 376 | 50 | 70 | 60 | 80 | 40 | 60 | 30 | 40 | 0 | 0 |
| **30** | **Pennsylvania Turnpike** | **Interchange 5** | **Interchange 6** | **-90** | **-110** | **-110** | **-140** | **-80** | **-100** | **-60** | **-80** | **-10** | **-10** |

**Table 6-21**

## Estimated Value Pricing Impacts of Diverted Turnpike Traffic on Alternative Routes

**PM Peak Hour: Westbound and Northbound Directions**

| Segment | | | | Scenario 1 | | Scenario 6 | | Scenario 9 | | Scenario 15 | | Scenario 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Name | Between | | Rate 1 | Rate 3 | Rate 1 | Rate 3 | Rate 1 | Rate 2 | Rate 1 | Rate 2 | Rate 2 | Rate 3 |
| | | | **Screenline 1** | | | | | | | | | | |
| 1 | Rt. 1 | Rt. 202 | Rt. 252 | 10 | 10 | 10 | 20 | 10 | 10 | 10 | 10 | 0 | 0 |
| 2 | Rt. 3 | Rt. 202 | Rt. 252 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Rt. 30 | Rt. 202 | Rt. 252 | 30 | 40 | 50 | 60 | 30 | 40 | 20 | 20 | 0 | 10 |
| **4** | **Pennsylvania Turnpike** | **Interchange 23** | **Interchange 24** | **-50** | **-60** | **-70** | **-90** | **-50** | **-60** | **-30** | **-40** | **-10** | **-20** |
| 5 | Rt. 23 | Rt. 100 | Rt. 29 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 | 0 | 0 |
| 6 | Rt. 422 | Rt. 100 | Rt. 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | Rt. 73 | Rt. 663 | Rt. 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | **Screenline 2** | | | | | | | | | | |
| 8 | I 95 | Rt. 70 | Rt. 73 | 80 | 100 | 90 | 110 | 70 | 90 | 50 | 60 | 10 | 20 |
| 9 | Rt. 1 | Rt. 611 | Rt. 232 | 20 | 20 | 20 | 20 | 10 | 20 | 10 | 10 | 0 | 0 |
| 10 | Rt. 73 | Rt. 611 | Rt. 309 | 40 | 50 | 40 | 50 | 30 | 40 | 20 | 30 | 0 | 10 |
| **11** | **Pennsylvania Turnpike** | **Interchange 26** | **Interchange 27** | **-270** | **-340** | **-290** | **-360** | **-230** | **-300** | **-160** | **-210** | **-30** | **-50** |
| 12 | Rt. 63 | Rt. 202 | PA TPK | 50 | 60 | 50 | 60 | 40 | 50 | 30 | 40 | 0 | 10 |
| 13 | Rt. 202 | Rt. 611 | Rt. 63 | 40 | 40 | 40 | 50 | 30 | 40 | 20 | 30 | 10 | 10 |
| | | | **Screenline 3** | | | | | | | | | | |
| 14 | I-295 | Rt. 73 | PA TPK | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 10 | 0 | 0 |
| **15** | **Pennsylvania Turnpike** | **Interchange 29** | **Interchange 30** | **-140** | **-170** | **-150** | **-180** | **-120** | **-150** | **-80** | **-100** | **-10** | **-20** |
| 16 | I 95 | Rt. 32 | Rt. 31 | 90 | 110 | 100 | 120 | 80 | 100 | 50 | 60 | 0 | 10 |
| 17 | Rt. 202 | Rt. 32 | Rt. 31 | 20 | 30 | 20 | 30 | 20 | 20 | 10 | 20 | 0 | 0 |
| | | | **Screenline 4** | | | | | | | | | | |
| 18 | Rt. 29 | Rt 73 | Rt. 63 | 40 | 50 | 40 | 50 | 30 | 40 | 20 | 30 | 0 | 0 |
| 19 | Rt. 63 | Rt. 29 | PA TPK | 20 | 30 | 20 | 30 | 20 | 30 | 20 | 20 | 0 | 0 |
| **20** | **Pennsylvania Turnpike** | **Interchange 31** | **Interchange 32** | **-120** | **-160** | **-140** | **-170** | **-100** | **-140** | **-70** | **-90** | **-10** | **-20** |
| 21 | Rt. 309 | Rt. 663 | Rt. 202 | 40 | 50 | 40 | 60 | 30 | 50 | 20 | 30 | 0 | 10 |
| 22 | Rt. 313 | Rt. 563 | Rt. 611 | 10 | 20 | 10 | 20 | 10 | 20 | 10 | 10 | 0 | 0 |
| | | | **Screenline 5** | | | | | | | | | | |
| 23 | Rt. 51 | Rt. 136 | Rt. 70 | 10 | 20 | 10 | 20 | 10 | 20 | 10 | 10 | 0 | 0 |
| **24** | **Pennsylvania Turnpike** | **Interchange 7** | **Interchange 8** | **-100** | **-120** | **-100** | **-130** | **-90** | **-120** | **-70** | **-100** | **-10** | **-10** |
| 25 | Rt. 119 | Rt. 66 | PA TPK | 50 | 60 | 50 | 70 | 40 | 60 | 40 | 50 | 0 | 0 |
| 26 | Rt. 30 | Rt. 119 | Rt. 981 | 10 | 20 | 10 | 20 | 10 | 20 | 10 | 10 | 0 | 10 |
| | | | **Screenline 6** | | | | | | | | | | |
| 27 | Rt. 51 | Rt. 19 | Rt. 837 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 |
| 28 | Rt. 376 | Rt. 51 | Rt. 30 | 10 | 20 | 20 | 20 | 10 | 20 | 10 | 20 | 10 | 10 |
| 29 | Rt. 8 | Rt. 380 | Rt. 376 | 50 | 70 | 60 | 70 | 50 | 60 | 40 | 50 | 0 | 10 |
| **30** | **Pennsylvania Turnpike** | **Interchange 5** | **Interchange 6** | **-80** | **-100** | **-90** | **-120** | **-70** | **-100** | **-70** | **-90** | **-10** | **-20** |

**Table 6-22**

## Estimated Value Pricing Impacts of Diverted Turnpike Traffic on Alternative Routes

**PM Peak Hour: Eastbound and Southbound Directions**

| Segment | | | | Scenario 1 | | Scenario 6 | | Scenario 9 | | Scenario 15 | | Scenario 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Name | Between | | Rate 1 | Rate 3 | Rate 1 | Rate 3 | Rate 1 | Rate 2 | Rate 1 | Rate 2 | Rate 2 | Rate 3 |
| | | | | | | **Screenline 1** | | | | | | | |
| 1 | Rt. 1 | Rt. 202 | Rt. 252 | 20 | 30 | 30 | 40 | 20 | 30 | 20 | 20 | 0 | 0 |
| 2 | Rt. 3 | Rt. 202 | Rt. 252 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 |
| 3 | Rt. 30 | Rt. 202 | Rt. 252 | 40 | 50 | 50 | 60 | 30 | 40 | 30 | 40 | 0 | 0 |
| **4** | **Pennsylvania Turnpike** | **Interchange 23** | **Interchange 24** | **-110** | **-150** | **-150** | **-180** | **-90** | **-130** | **-80** | **-110** | **-20** | **-20** |
| 5 | Rt. 23 | Rt. 100 | Rt. 29 | 20 | 30 | 30 | 40 | 20 | 30 | 20 | 20 | 0 | 0 |
| 6 | Rt. 422 | Rt. 100 | Rt. 29 | 10 | 10 | 10 | 10 | 0 | 10 | 0 | 10 | 0 | 0 |
| 7 | Rt. 73 | Rt. 663 | Rt. 29 | 10 | 10 | 20 | 20 | 10 | 10 | 0 | 10 | 0 | 0 |
| | | | | | | **Screenline 2** | | | | | | | |
| 8 | I 95 | Rt. 70 | Rt. 73 | 140 | 170 | 160 | 230 | 110 | 150 | 80 | 100 | 20 | 30 |
| 9 | Rt. 1 | Rt. 611 | Rt. 232 | 70 | 80 | 70 | 110 | 50 | 70 | 40 | 50 | 0 | 10 |
| 10 | Rt. 73 | Rt. 611 | Rt. 309 | 40 | 50 | 50 | 70 | 30 | 40 | 20 | 30 | 10 | 0 |
| **11** | **Pennsylvania Turnpike** | **Interchange 26** | **Interchange 27** | **-390** | **-480** | **-450** | **-640** | **-330** | **-420** | **-220** | **-270** | **-40** | **-60** |
| 12 | Rt. 63 | Rt. 202 | PA TPK | 60 | 80 | 70 | 100 | 50 | 70 | 30 | 40 | 0 | 10 |
| 13 | Rt. 202 | Rt. 611 | Rt. 63 | 50 | 60 | 50 | 80 | 40 | 50 | 30 | 30 | 0 | 10 |
| | | | | | | **Screenline 3** | | | | | | | |
| 14 | I-295 | Rt. 73 | PA TPK | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 | 0 | 0 |
| **15** | **Pennsylvania Turnpike** | **Interchange 29** | **Interchange 30** | **-50** | **-60** | **-60** | **-80** | **-40** | **-50** | **-30** | **-30** | **-10** | **-10** |
| 16 | I 95 | Rt. 32 | Rt. 31 | 40 | 50 | 50 | 60 | 30 | 40 | 20 | 30 | 10 | 10 |
| 17 | Rt. 202 | Rt. 32 | Rt. 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | **Screenline 4** | | | | | | | |
| 18 | Rt. 29 | Rt 73 | Rt. 63 | 30 | 40 | 30 | 50 | 20 | 30 | 20 | 20 | 0 | 0 |
| 19 | Rt. 63 | Rt. 29 | PA TPK | 20 | 30 | 20 | 30 | 20 | 30 | 10 | 20 | 0 | 0 |
| **20** | **Pennsylvania Turnpike** | **Interchange 31** | **Interchange 32** | **-160** | **-200** | **-190** | **-240** | **-140** | **-180** | **-80** | **-100** | **-20** | **-30** |
| 21 | Rt. 309 | Rt. 663 | Rt. 202 | 50 | 70 | 60 | 80 | 40 | 60 | 30 | 30 | 0 | 10 |
| 22 | Rt. 313 | Rt. 563 | Rt. 611 | 20 | 20 | 20 | 20 | 10 | 20 | 10 | 10 | 0 | 0 |
| | | | | | | **Screenline 5** | | | | | | | |
| 23 | Rt. 51 | Rt. 136 | Rt. 70 | 20 | 20 | 20 | 30 | 20 | 20 | 20 | 20 | 0 | 0 |
| **24** | **Pennsylvania Turnpike** | **Interchange 7** | **Interchange 8** | **-50** | **-60** | **-60** | **-80** | **-50** | **-60** | **-40** | **-50** | **-10** | **-10** |
| 25 | Rt. 119 | Rt. 66 | PA TPK | 30 | 40 | 30 | 40 | 30 | 30 | 20 | 30 | 0 | 0 |
| 26 | Rt. 30 | Rt. 119 | Rt. 981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | **Screenline 6** | | | | | | | |
| 27 | Rt. 51 | Rt. 19 | Rt. 837 | 10 | 10 | 10 | 20 | 10 | 10 | 10 | 10 | 0 | 0 |
| 28 | Rt. 376 | Rt. 51 | Rt. 30 | 50 | 60 | 60 | 80 | 40 | 60 | 40 | 50 | 0 | 10 |
| 29 | Rt. 8 | Rt. 380 | Rt. 376 | 40 | 50 | 50 | 60 | 40 | 50 | 30 | 40 | 0 | 0 |
| **30** | **Pennsylvania Turnpike** | **Interchange 5** | **Interchange 6** | **-100** | **-130** | **-130** | **-170** | **-100** | **-130** | **-80** | **-110** | **-10** | **-10** |

## Table 6-23
## Overall Comparative Summary
## of Estimated Value Pricing Results at 2002 Levels

Pennsylvania Turnpike Value Pricing Study

| Value Pricing Scenario | VP Toll Scenario | Estimated Annual Revenue Impact (1,000s) | Annual Percent Revenue Impact | Passenger Car Urban Interchange Percent AM Peak Traffic Impacts | | | Percent Car AM Peak E-ZPass Share (1) |
|---|---|---|---|---|---|---|---|
| | | | | Diverted | Shifted | Total | |
| Base | | $0 | - - | - - | - - | - - | 42.9 |
| 1 | 1 | 37,364 | 10.0 | (9.4) | (7.0) | (16.4) | 41.7 |
| | 3 | 46,204 | 12.3 | (12.3) | (9.5) | (21.8) | 41.2 |
| 3 | 1 | 62,717 | 16.7 | (9.4) | (7.0) | (16.4) | 41.7 |
| | 3 | 77,416 | 20.7 | (12.3) | (9.5) | (21.8) | 41.2 |
| 6 | 1 | 45,441 | 12.1 | (8.8) | (6.9) | (15.7) | 40.3 |
| | 3 | 56,425 | 15.1 | (11.4) | (9.3) | (20.7) | 39.8 |
| 9 | 1 | 35,424 | 9.5 | (8.1) | (6.2) | (14.3) | 44.8 |
| | 2 | 44,421 | 11.9 | (11.0) | (9.2) | (20.2) | 44.1 |
| 15 | 1 | 67,255 | 18.0 | (5.0) | 0.0 | (5.0) | 53.4 |
| | 2 | 82,248 | 22.0 | (6.4) | 0.0 | (6.4) | 56.9 |
| 17-1 | 1 | 74,696 | 19.9 | (9.4) | (7.0) | (16.4) | 41.7 |
| | 3 | 91,657 | 24.5 | (12.3) | (9.5) | (21.8) | 41.2 |
| 17-9 | 1 | 72,757 | 19.4 | (8.1) | (6.2) | (14.3) | 44.8 |
| | 2 | 89,873 | 24.0 | (11.0) | (9.2) | (20.2) | 44.1 |
| 20 | 2 | 17,599 | 4.7 | (0.7) | 0.0 | (0.7) | 44.4 |
| | 3 | 33,326 | 8.9 | (1.3) | 0.0 | (1.3) | 45.8 |

(1) The percent E-ZPass share shown is only for the average weekday condition at the urban interchanges.

## Table 6-24
## Overall Comparative Summary
## of Estimated Value Pricing Results at 2012 Levels

Pennsylvania Turnpike Value Pricing Study

| Value Pricing Scenario | VP Toll Scenario | Estimated Annual Revenue Impact (1,000s) | Annual Percent Revenue Impact | Passenger Car Urban Interchange Percent AM Peak Traffic Impacts | | | Percent Car AM Peak E-ZPass Share (1) |
|---|---|---|---|---|---|---|---|
| | | | | Diverted | Shifted | Total | |
| Base | | $0 | - - | - - | - - | - - | 54.6 |
| 1 | 1 | 51,245 | 10.1 | (6.9) | (7.5) | (14.4) | 53.3 |
| | 3 | 63,462 | 12.5 | (9.5) | (10.2) | (19.7) | 52.8 |
| 3 | 1 | 87,482 | 17.2 | (6.9) | (7.5) | (14.4) | 53.3 |
| | 3 | 108,182 | 21.2 | (9.5) | (10.2) | (19.7) | 52.8 |
| 6 | 1 | 62,594 | 12.3 | (6.5) | (7.4) | (13.9) | 51.6 |
| | 3 | 77,697 | 15.2 | (8.9) | (10.0) | (18.9) | 51.1 |
| 9 | 1 | 47,754 | 9.4 | (5.5) | (6.2) | (11.7) | 56.1 |
| | 2 | 60,399 | 11.9 | (8.1) | (9.2) | (17.3) | 55.5 |
| 15 | 1 | 89,144 | 17.5 | (3.0) | 0.0 | (3.0) | 62.6 |
| | 2 | 109,362 | 21.5 | (4.0) | 0.0 | (4.0) | 65.3 |
| 17-1 | 1 | 102,172 | 20.1 | (6.9) | (7.5) | (14.4) | 53.3 |
| | 3 | 125,652 | 24.7 | (9.5) | (10.2) | (19.7) | 52.8 |
| 17-9 | 1 | 98,680 | 19.4 | (5.5) | (6.2) | (11.7) | 56.1 |
| | 2 | 122,589 | 24.1 | (8.1) | (9.2) | (17.3) | 55.5 |
| 20 | 2 | 24,459 | 4.8 | (0.2) | 0.0 | (0.2) | 55.5 |
| | 3 | 44,841 | 8.8 | (0.6) | 0.0 | (0.6) | 56.7 |

(1) The percent E-ZPass share shown is only for the average weekday condition at the urban interchanges.

**Table 6-25**
**Comparison of Estimated Weekday E-Zpass Market Share (1)**

| Value Pricing Scenario | Rate | Percent E-Zpass Market Share | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2002 Level | | | 2012 Level | | |
| | | Car | Trucks | Total | Cars | Trucks | Total |
| Base | | 35.5 | 59.2 | 38.4 | 46.7 | 59.1 | 48.4 |
| 1 | 1 | 43.1 | 61.9 | 45.5 | 52.8 | 61.6 | 53.9 |
| | 3 | 45.9 | 62.7 | 48.1 | 55.0 | 62.3 | 56.0 |
| 3 | 1 | 43.1 | 61.9 | 45.5 | 52.8 | 61.6 | 53.9 |
| | 3 | 45.9 | 62.7 | 48.1 | 55.0 | 62.3 | 56.0 |
| 6 | 1 | 43.1 | 61.9 | 45.5 | 52.8 | 61.6 | 53.9 |
| | 3 | 45.9 | 62.7 | 48.1 | 55.0 | 62.3 | 56.0 |
| 9 | 1 | 43.9 | 62.0 | 46.2 | 53.4 | 61.7 | 54.5 |
| | 2 | 46.6 | 62.8 | 48.7 | 55.6 | 62.4 | 56.5 |
| 15 | 1 | 45.4 | 61.5 | 47.5 | 54.6 | 61.1 | 55.5 |
| | 2 | 48.9 | 62.2 | 50.7 | 57.5 | 61.8 | 58.0 |
| 17-1 | 1 | 43.1 | 61.9 | 45.5 | 52.8 | 61.6 | 53.9 |
| | 3 | 45.9 | 62.7 | 48.1 | 55.0 | 62.3 | 56.0 |
| 17-9 | 1 | 43.9 | 62.0 | 46.2 | 53.4 | 61.7 | 54.5 |
| | 2 | 46.6 | 62.8 | 48.7 | 55.6 | 62.4 | 56.5 |
| 20 | 2 | 36.9 | 59.4 | 39.8 | 47.8 | 59.2 | 49.3 |
| | 3 | 38.4 | 59.8 | 41.1 | 49.0 | 59.6 | 50.3 |

(1) These market share values represent the average E-Zpass participation rates for a weekday condition, including the AM, PM, and off-peak periods. These values also represent the average of all urban interchanges (4-8 and 23-33) considered in this analysis.

**Table 6-26**

## Summary of Estimated 2002 Level Total Daily Traffic Impacts and the Resulting Impact on Operating Costs

Pennsylvania Turnpike Value Pricing Study

| VP Scenario and Toll Rate | Estimated Daily Traffic Impact | | | Estimated Impact on Annual Operating Costs (1,000s) | | |
|---|---|---|---|---|---|---|
| | Cash | ETC | Total | Cash | ETC | Total |
| Scenario 1 | | | | | | |
| Rate 1 | (35,511) | 12,708 | (22,803) | ($3,601) | $562 | ($3,039) |
| Rate 3 | (46,663) | 17,394 | (29,269) | (4,732) | 769 | (3,963) |
| Scenario 3 | | | | | | |
| Rate 1 | (51,133) | 14,718 | (36,415) | (5,185) | 651 | (4,534) |
| Rate 3 | (67,186) | 20,143 | (47,042) | (6,813) | 890 | (5,922) |
| Scenario 6 | | | | | | |
| Rate 1 | (40,655) | 15,369 | (25,286) | (4,122) | 679 | (3,443) |
| Rate 3 | (53,514) | 21,031 | (32,483) | (5,426) | 930 | (4,497) |
| Scenario 9 | | | | | | |
| Rate 1 | (36,834) | 15,345 | (21,489) | (3,735) | 678 | (3,057) |
| Rate 2 | (47,889) | 19,799 | (28,090) | (4,856) | 875 | (3,981) |
| Scenario 15 | | | | | | |
| Rate 1 | (56,577) | 24,007 | (32,570) | (8,054) | 1,490 | (6,564) |
| Rate 2 | (74,147) | 32,240 | (41,907) | (10,555) | 2,000 | (8,554) |
| Scenario 17-1 | | | | | | |
| Rate 1 | (51,637) | 17,261 | (34,375) | (7,350) | 1,071 | (6,279) |
| Rate 3 | (67,761) | 23,415 | (44,345) | (9,646) | 1,453 | (8,193) |
| Scenario 17-9 | | | | | | |
| Rate 1 | (52,582) | 19,145 | (33,437) | (7,485) | 1,188 | (6,297) |
| Rate 2 | (68,636) | 25,133 | (43,503) | (9,770) | 1,560 | (8,211) |
| Scenario 20 | | | | | | |
| Rate 2 | (8,398) | 3,781 | (4,617) | (1,195) | 235 | (961) |
| Rate 3 | (16,764) | 7,606 | (9,158) | (2,386) | 472 | (1,914) |

Note: This annual operating cost savings are based on an assumed per transaction cost of $0.17 for ETC transactions and $0.39 for cash transactions.
The annual revenue impact is based on 260 weekdays per year for Scenarios 1-9, and on 365 days per year for Scenarios 15, 17-1, 17-9 and 20.

**Table 6-27**

## Summary of Estimated 2012 Level Total Daily Traffic Impacts and the Resulting Impact on Operating Costs

Pennsylvania Turnpike Value Pricing Study

| VP Scenario and Toll Rate | Estimated Daily Traffic Impact | | | Estimated Impact on Annual Operating Costs (1,000s) | | |
|---|---|---|---|---|---|---|
| | Cash | ETC | Total | Cash | ETC | Total |
| Scenario 1 | | | | | | |
| Rate 1 | (34,310) | 13,191 | (21,119) | ($3,479) | $583 | ($2,896) |
| Rate 3 | (46,276) | 17,774 | (28,502) | (4,692) | 786 | (3,907) |
| Scenario 3 | | | | | | |
| Rate 1 | (51,399) | 15,324 | (36,075) | (5,212) | 677 | (4,535) |
| Rate 3 | (69,319) | 20,637 | (48,682) | (7,029) | 912 | (6,117) |
| Scenario 6 | | | | | | |
| Rate 1 | (39,848) | 16,323 | (23,525) | (4,041) | 721 | (3,319) |
| Rate 3 | (53,892) | 22,035 | (31,857) | (5,465) | 974 | (4,491) |
| Scenario 9 | | | | | | |
| Rate 1 | (35,828) | 16,619 | (19,209) | (3,633) | 735 | (2,898) |
| Rate 2 | (47,673) | 20,982 | (26,691) | (4,834) | 927 | (3,907) |
| Scenario 15 | | | | | | |
| Rate 1 | (57,721) | 26,290 | (31,431) | (8,217) | 1,631 | (6,585) |
| Rate 2 | (77,443) | 35,309 | (42,134) | (11,024) | 2,191 | (8,833) |
| Scenario 17-1 | | | | | | |
| Rate 1 | (52,477) | 18,415 | (34,062) | (7,470) | 1,143 | (6,327) |
| Rate 3 | (70,584) | 24,773 | (45,811) | (10,048) | 1,537 | (8,510) |
| Scenario 17-9 | | | | | | |
| Rate 1 | (53,561) | 20,863 | (32,697) | (7,624) | 1,295 | (6,330) |
| Rate 2 | (71,582) | 27,065 | (44,517) | (10,190) | 1,679 | (8,510) |
| Scenario 20 | | | | | | |
| Rate 2 | (6,550) | 4,157 | (2,393) | (932) | 258 | (674) |
| Rate 3 | (15,472) | 8,351 | (7,121) | (2,202) | 518 | (1,684) |

Note: This annual operating cost savings are based on an assumed per transaction cost of $0.17 for ETC transactions and $0.39 for cash transactions.
The annual revenue impact is based on 260 weekdays per year for Scenarios 1-9, and on 365 days per year for Scenarios 15, 17-1, 17-9 and 20.

**Table 6-28**

## Potential Value Pricing Scenario Selection Criteria

Pennsylvania Turnpike

Interim Value Pricing Implementation Criteria Weighting

| VP Scenario | VP Toll Revenue Impact | Implementation Costs | Impact on Mainline Operations | Impact on Interchange Operations | Increased E-ZPass Participation | Ease of Implementation | Public Acceptance | Impact on Alternative Routes | Average Weighted Factor |
|---|---|---|---|---|---|---|---|---|---|
| Weighting Factor | 0.10 | 0.15 | 0.05 | 0.10 | 0.10 | 0.20 | 0.20 | 0.10 | 1.00 |
| Scenario 1 | | | | | | | | | |
| Rate 1 | 2.0 | 2.5 | 4.0 | 3.5 | 3.0 | 3.0 | 3.5 | 3.0 | 3.03 |
| Rate 3 | 3.0 | 2.5 | 5.0 | 5.0 | 4.0 | 3.0 | 3.0 | 2.5 | 3.28 |
| Scenario 3 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 4.0 | 3.5 | 3.0 | 3.5 | 2.5 | 3.0 | 3.13 |
| Rate 3 | 5.0 | 2.5 | 5.0 | 5.0 | 4.0 | 3.5 | 2.0 | 2.5 | 3.38 |
| Scenario 6 | | | | | | | | | |
| Rate 1 | 3.0 | 2.5 | 4.0 | 3.5 | 3.0 | 2.0 | 3.0 | 3.5 | 2.88 |
| Rate 3 | 4.0 | 2.5 | 5.0 | 5.0 | 4.0 | 2.0 | 2.5 | 2.5 | 3.08 |
| Scenario 9 | | | | | | | | | |
| Rate 1 | 2.0 | 2.5 | 3.5 | 3.5 | 3.0 | 2.5 | 4.0 | 3.5 | 3.05 |
| Rate 2 | 3.0 | 2.5 | 4.5 | 5.0 | 4.0 | 2.5 | 3.5 | 3.0 | 3.30 |
| Scenario 15 | | | | | | | | | |
| Rate 1 | 4.0 | 4.5 | 2.0 | 2.5 | 3.5 | 4.0 | 3.5 | 4.0 | 3.68 |
| Rate 2 | 5.0 | 4.5 | 2.0 | 3.5 | 4.5 | 4.0 | 3.0 | 3.5 | 3.83 |
| Scenario 17-1 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 4.0 | 3.5 | 3.5 | 2.0 | 3.0 | 3.0 | 2.98 |
| Rate 3 | 5.0 | 2.5 | 5.0 | 5.0 | 4.5 | 2.0 | 2.5 | 2.5 | 3.23 |
| Scenario 17-9 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 3.5 | 3.5 | 3.5 | 2.0 | 3.5 | 3.5 | 3.10 |
| Rate 2 | 5.0 | 2.5 | 4.5 | 5.0 | 4.5 | 2.0 | 3.0 | 3.0 | 3.35 |
| Scenario 20 | | | | | | | | | |
| Rate 2 | 1.0 | 4.5 | 1.0 | 2.0 | 1.5 | 5.0 | 5.0 | 5.0 | 3.68 |
| Rate 3 | 2.0 | 4.5 | 1.5 | 3.0 | 2.0 | 5.0 | 4.5 | 4.5 | 3.80 |
| | 1 - 0-5%<br>2 - 5-10<br>3 - 10-15<br>4 - 15-20<br>5 - 20-25 | 1 - Most<br>5 - Least | 1 - Worst<br>5 - Best | 1 - Worst<br>5 - Best | 1 - Lowest<br>5 - Highest | 1 - Hardest<br>5 - Easiest | 1 - Least<br>5 - Most | 1 - Most<br>5 - Least | 1 - Lowest<br>5 - Highest |

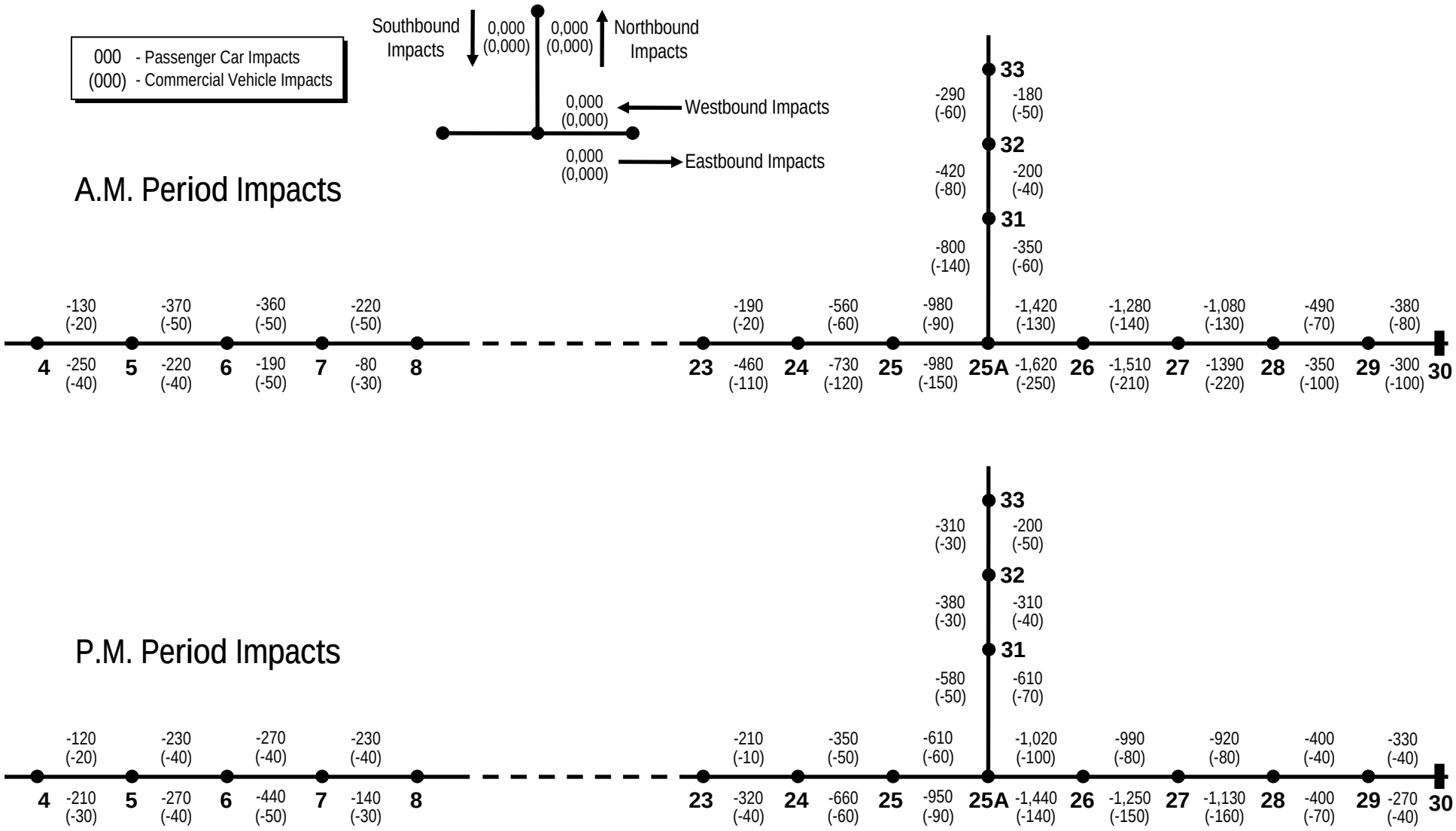
**Table 6-29**

## Potential Value Pricing Scenario Selection Criteria

Pennsylvania Turnpike

Ultimate Revenue and Operational Improvement Criteria Weighting

| VP Scenario | VP Toll Revenue Impact | Implementation Costs | Impact on Mainline Operations | Impact on Interchange Operations | Increased E-ZPass Participation | Ease of Implementation | Public Acceptance | Impact on Alternative Routes | Average Weighted Factor |
|---|---|---|---|---|---|---|---|---|---|
| Weighting Factor | 0.20 | 0.03 | 0.20 | 0.20 | 0.15 | 0.02 | 0.10 | 0.10 | 1.00 |
| Scenario 1 | | | | | | | | | |
| Rate 1 | 2.0 | 2.5 | 4.0 | 3.5 | 3.0 | 3.0 | 3.5 | 3.0 | 3.14 |
| Rate 3 | 3.0 | 2.5 | 5.0 | 5.0 | 4.0 | 3.0 | 3.0 | 2.5 | 3.89 |
| Scenario 3 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 4.0 | 3.5 | 3.0 | 3.5 | 2.5 | 3.0 | 3.45 |
| Rate 3 | 5.0 | 2.5 | 5.0 | 5.0 | 4.0 | 3.5 | 2.0 | 2.5 | 4.20 |
| Scenario 6 | | | | | | | | | |
| Rate 1 | 3.0 | 2.5 | 4.0 | 3.5 | 3.0 | 2.0 | 3.0 | 3.5 | 3.32 |
| Rate 3 | 4.0 | 2.5 | 5.0 | 5.0 | 4.0 | 2.0 | 2.5 | 2.5 | 4.02 |
| Scenario 9 | | | | | | | | | |
| Rate 1 | 2.0 | 2.5 | 3.5 | 3.5 | 3.0 | 2.5 | 4.0 | 3.5 | 3.13 |
| Rate 2 | 3.0 | 2.5 | 4.5 | 5.0 | 4.0 | 2.5 | 3.5 | 3.0 | 3.88 |
| Scenario 15 | | | | | | | | | |
| Rate 1 | 4.0 | 4.5 | 2.0 | 2.5 | 3.5 | 4.0 | 3.5 | 4.0 | 3.19 |
| Rate 2 | 5.0 | 4.5 | 2.0 | 3.5 | 4.5 | 4.0 | 3.0 | 3.5 | 3.64 |
| Scenario 17-1 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 4.0 | 3.5 | 3.5 | 2.0 | 3.0 | 3.0 | 3.54 |
| Rate 3 | 5.0 | 2.5 | 5.0 | 5.0 | 4.5 | 2.0 | 2.5 | 2.5 | 4.29 |
| Scenario 17-9 | | | | | | | | | |
| Rate 1 | 4.0 | 2.5 | 3.5 | 3.5 | 3.5 | 2.0 | 3.5 | 3.5 | 3.54 |
| Rate 2 | 5.0 | 2.5 | 4.5 | 5.0 | 4.5 | 2.0 | 3.0 | 3.0 | 4.29 |
| Scenario 20 | | | | | | | | | |
| Rate 2 | 1.0 | 4.5 | 1.0 | 2.0 | 1.5 | 5.0 | 5.0 | 5.0 | 2.26 |
| Rate 3 | 2.0 | 4.5 | 1.5 | 3.0 | 2.0 | 5.0 | 4.5 | 4.5 | 2.74 |
| | 1 - 0-5%<br>2 - 5-10<br>3 - 10-15<br>4 - 15-20<br>5 - 20-25 | 1 - Most<br>5 - Least | 1 - Worst<br>5 - Best | 1 - Worst<br>5 - Best | 1 - Lowest<br>5 - Highest | 1 - Hardest<br>5 - Easiest | 1 - Least<br>5 - Most | 1 - Most<br>5 - Least | 1 - Lowest<br>5 - Highest |

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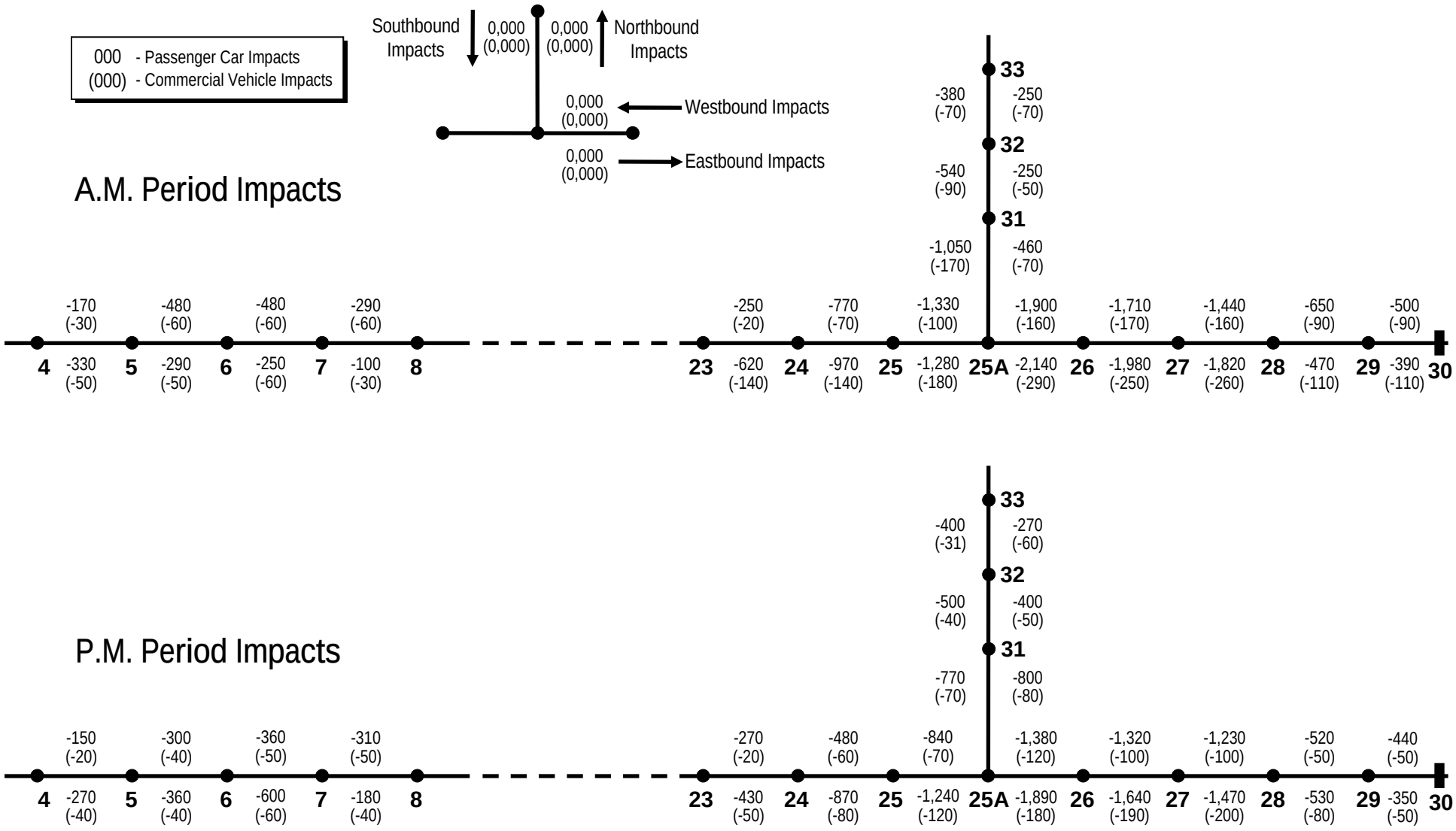
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS SCENARIOS 1, 3 and 17-1: RATE 1

FIGURE 6-1

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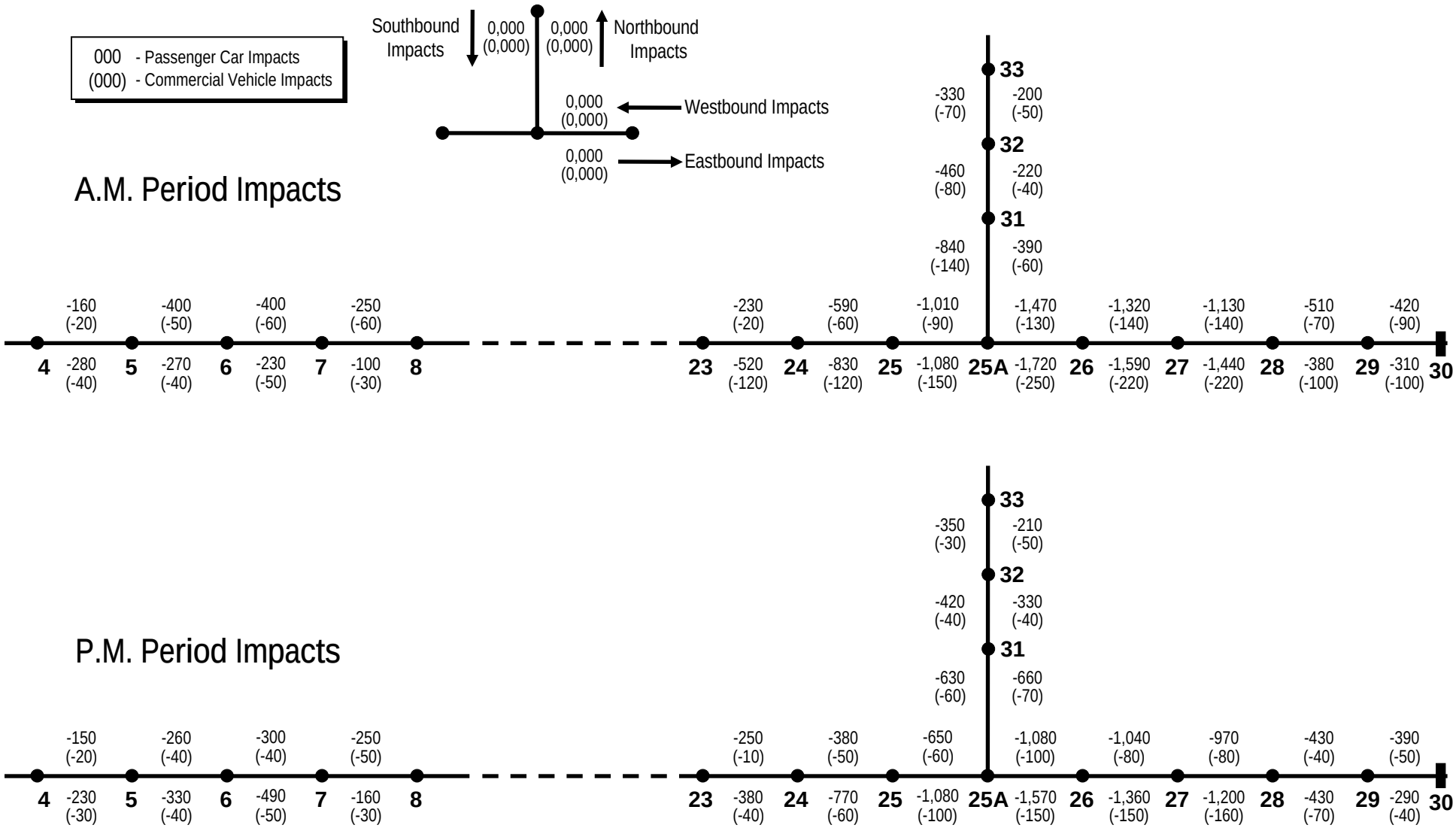
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS SCENARIOS 1, 3 and 17-1: RATE 3

FIGURE 6-2

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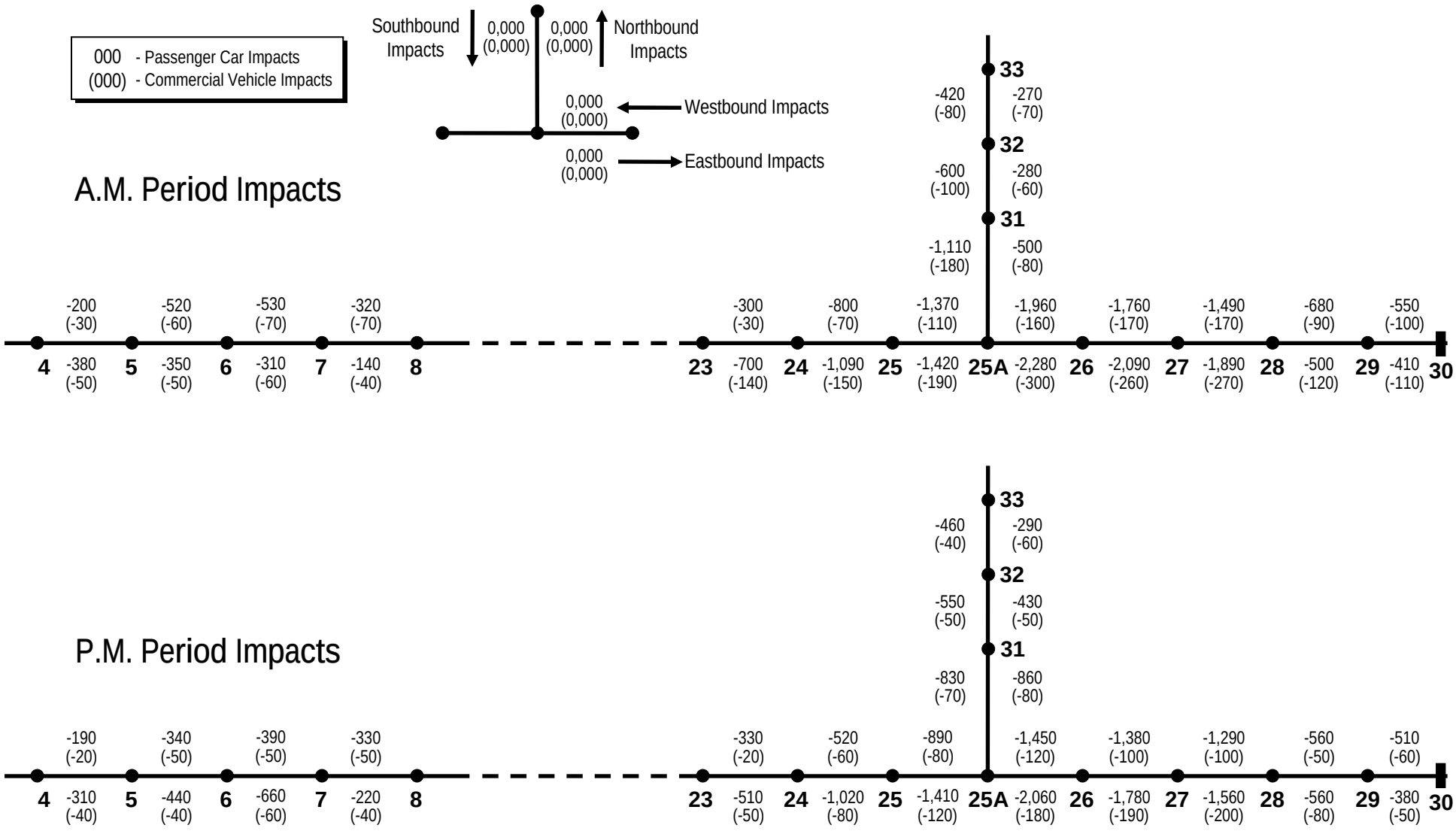
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS
## SCENARIO 6: RATE 1

FIGURE 6-3

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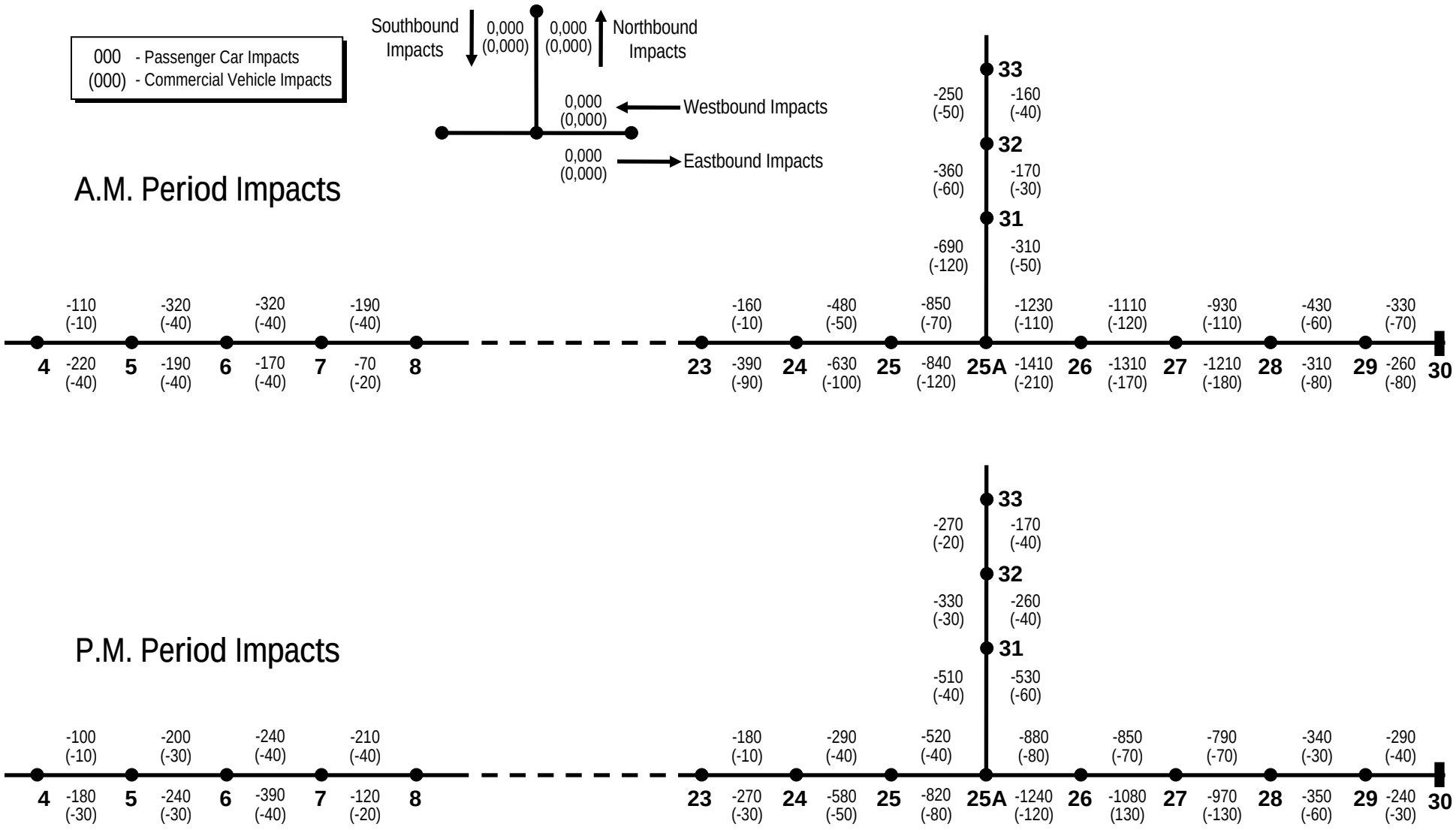
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS
## SCENARIO 6: RATE 3

FIGURE 6-4

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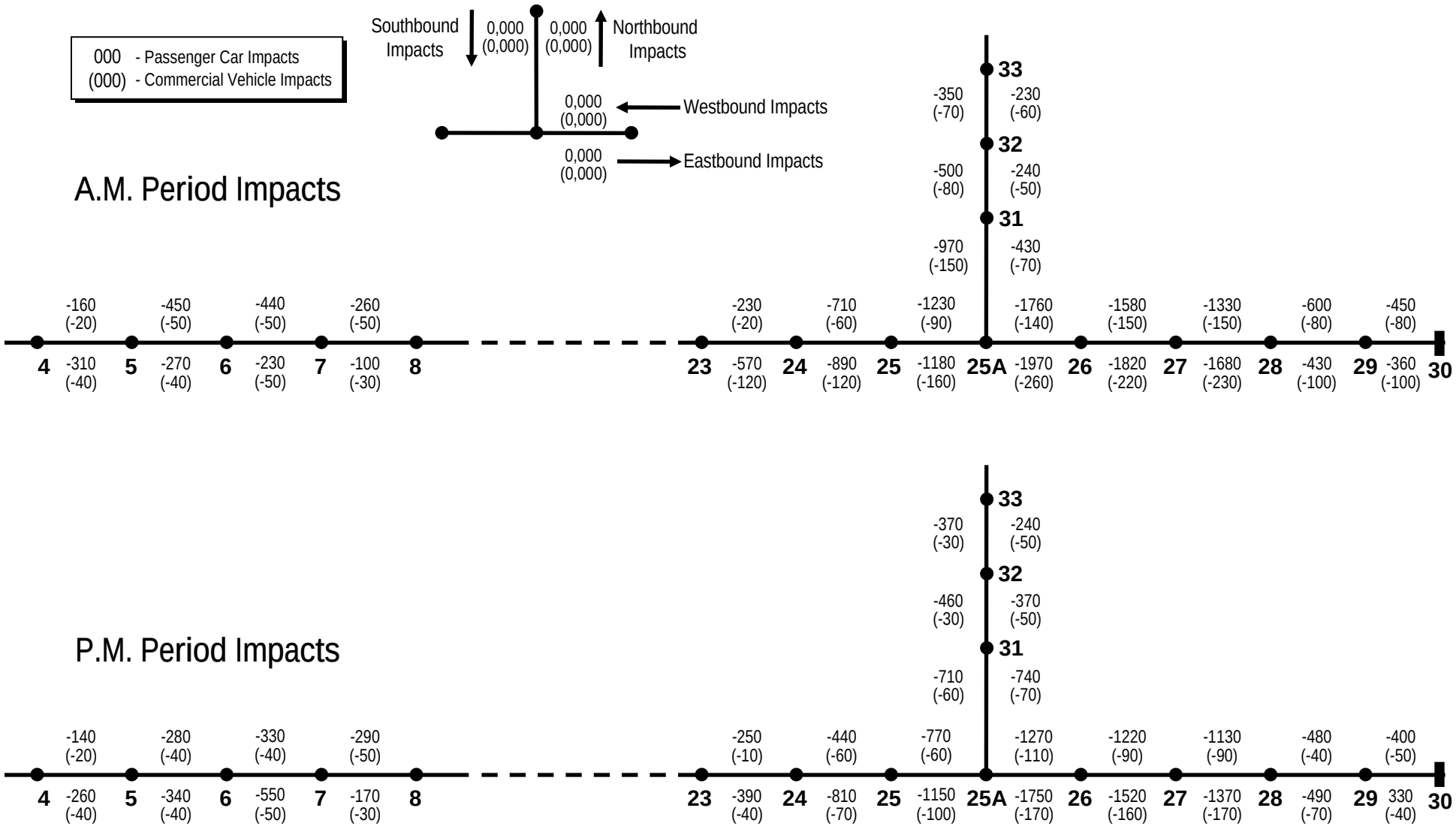
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS SCENARIO 9 and 17-9: RATE 1

FIGURE 6-5

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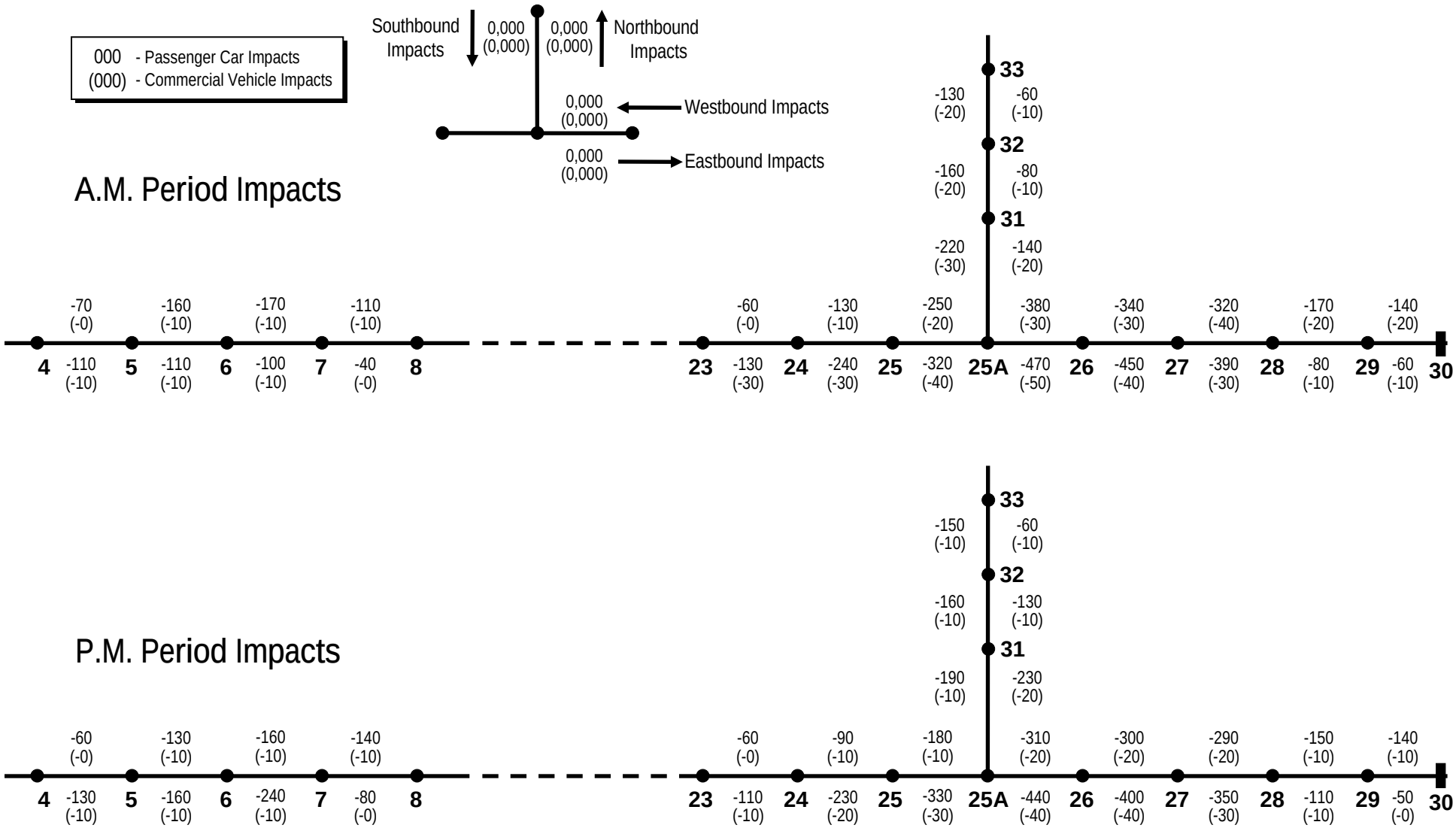
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS
## SCENARIO 9 and 17-9: RATE 2

FIGURE 6-6

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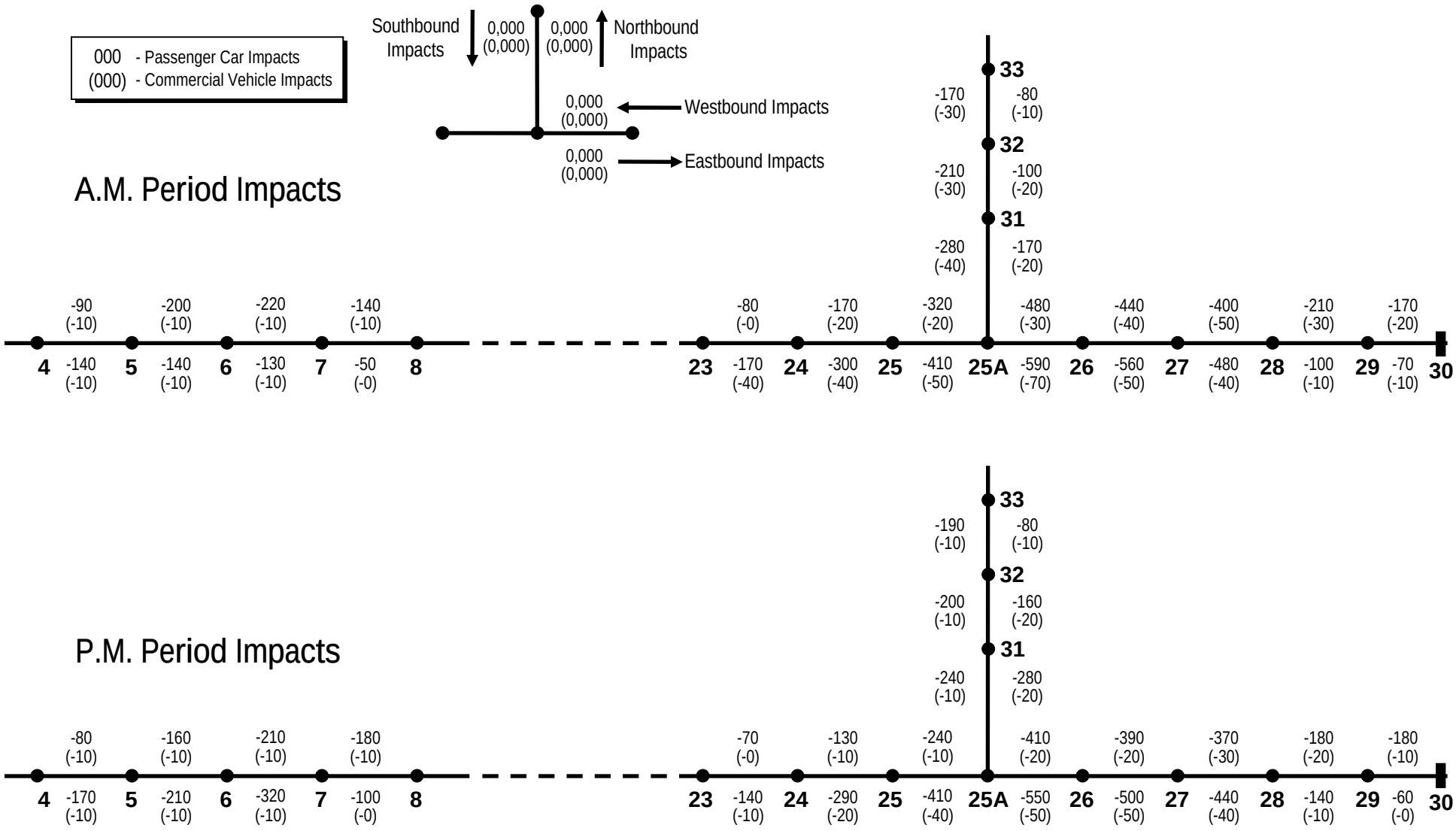
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS
## SCENARIO 15: RATE 1

FIGURE 6-7

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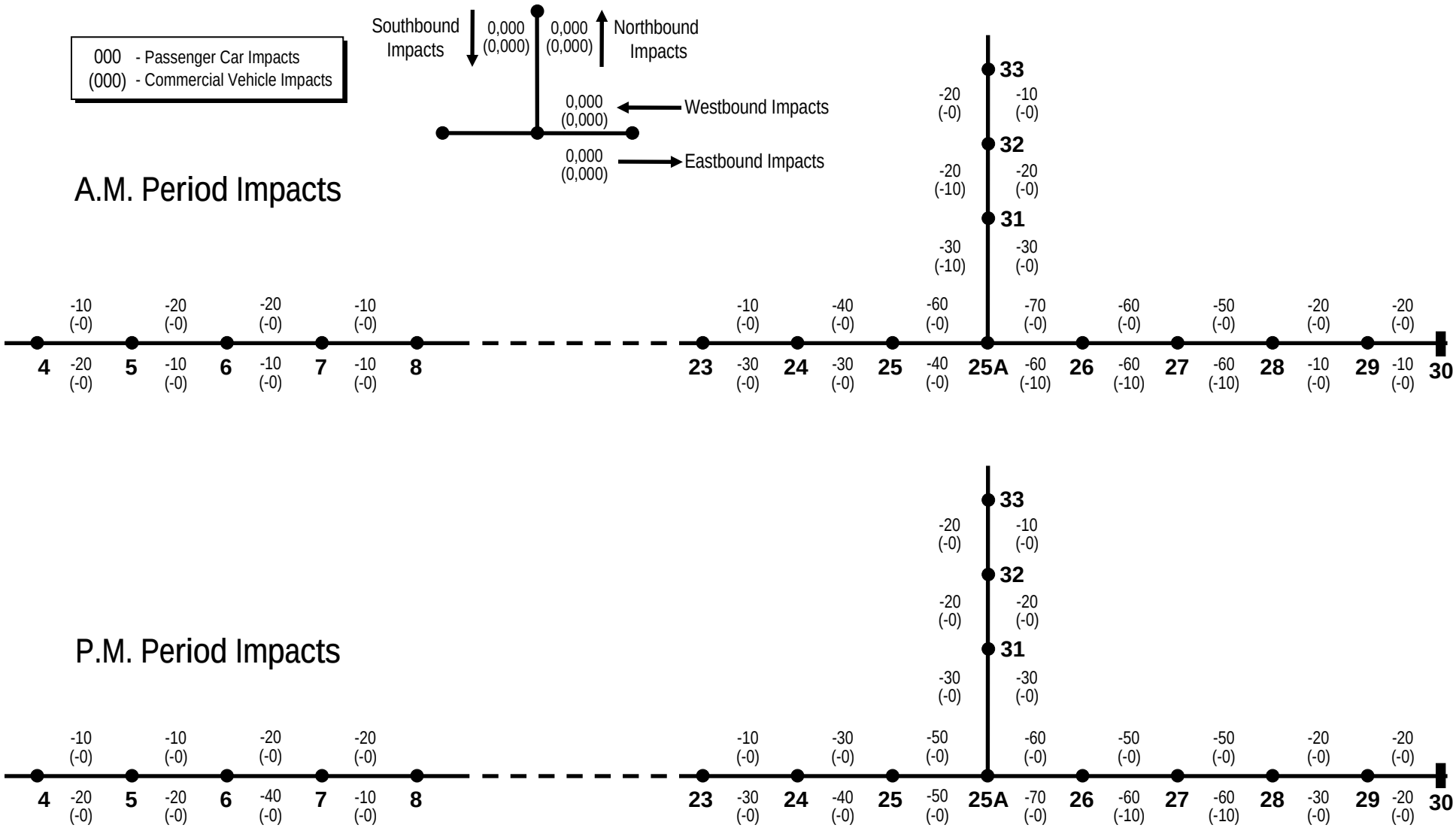
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS
## SCENARIO 15: RATE 2

FIGURE 6-8

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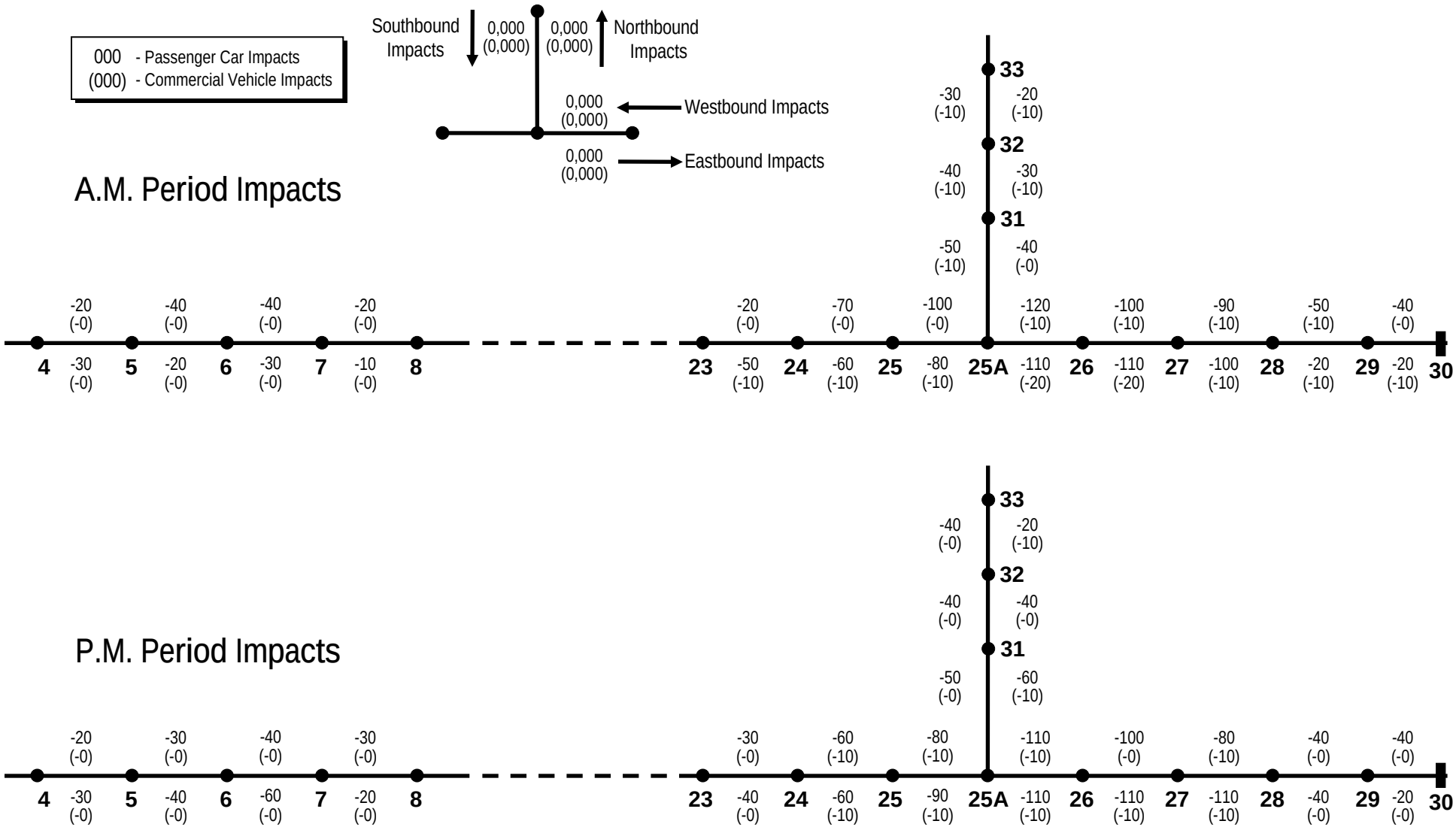
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS SCENARIO 20: RATE 2

FIGURE 6-9

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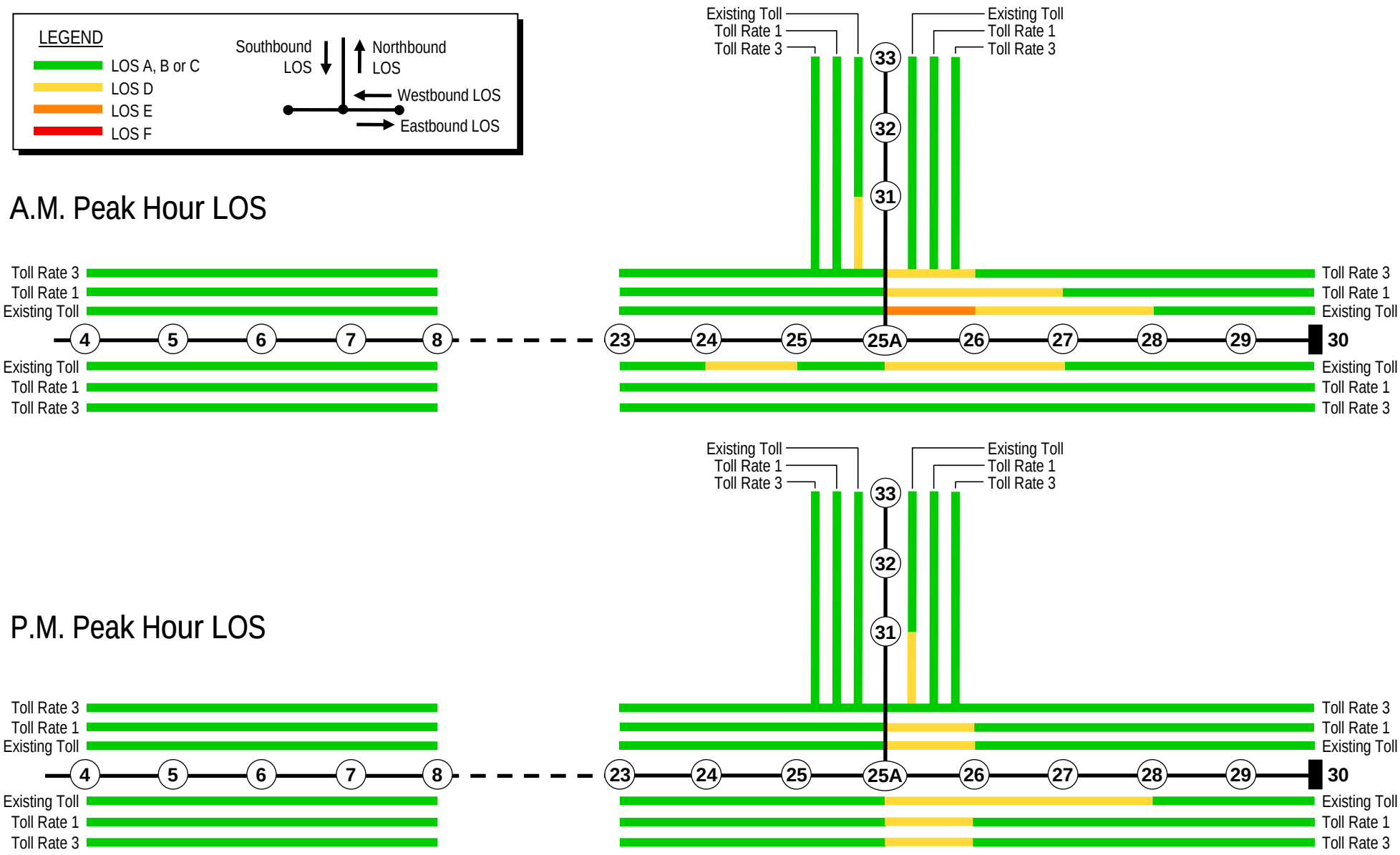
## ESTIMATED 2002 PEAK PERIOD VALUE PRICING MAINLINE IMPACTS
## SCENARIO 20: RATE 3

FIGURE 6-10

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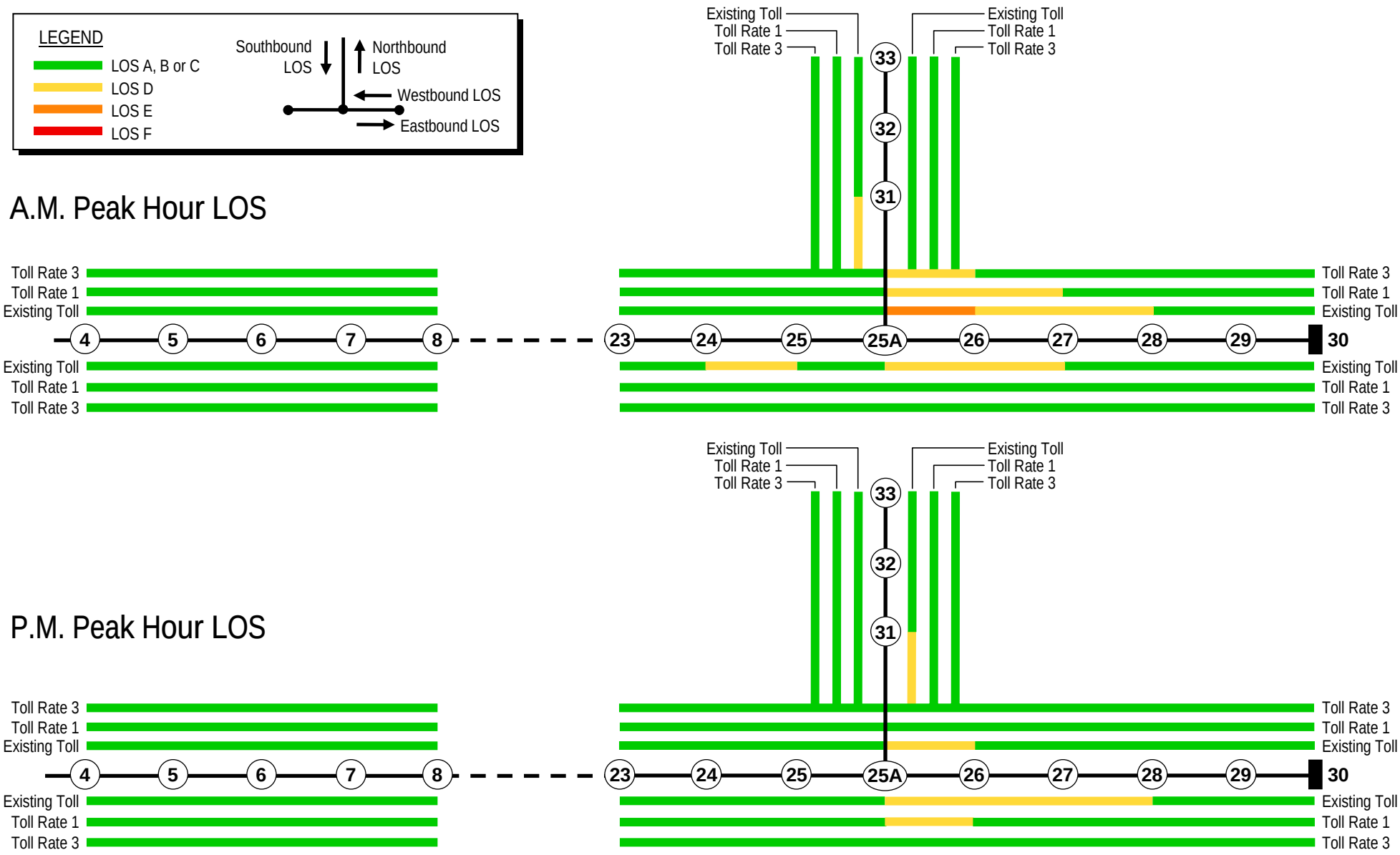
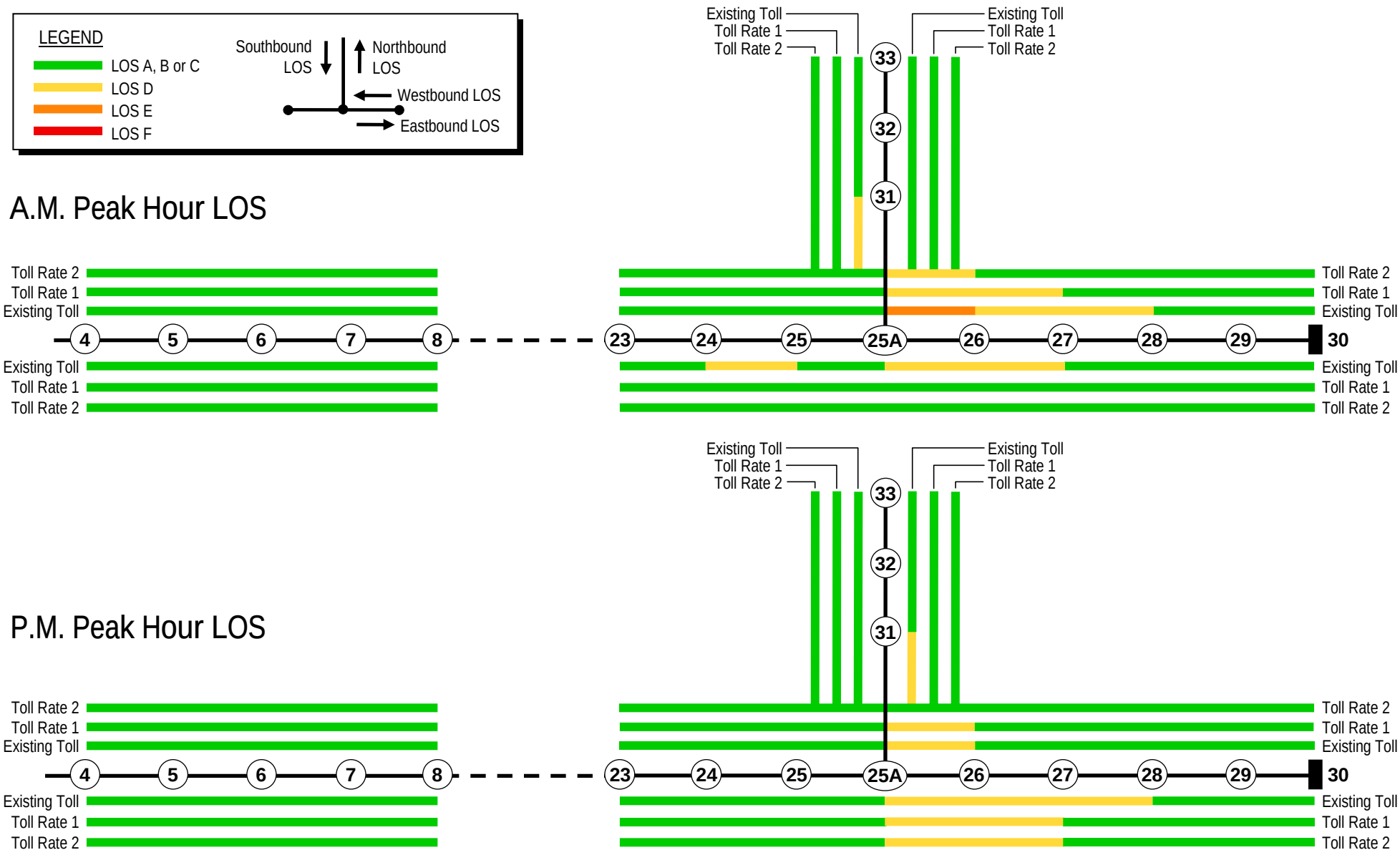
## ESTIMATED 2002 WEEKDAY PEAK HOUR LEVELS OF SERVICE
### SCENARIOS 1, 3 and 17-1

FIGURE 6-11


LEGEND
LOS A, B or C
LOS D
LOS E
LOS F
Southbound LOS
Northbound LOS
Westbound LOS
Eastbound LOS
A.M. Peak Hour LOS
Existing Toll
Toll Rate 1
Toll Rate 3
4
5
6
7
8
23
24
25
25A
26
27
28
29
30
31
32
33
P.M. Peak Hour LOS

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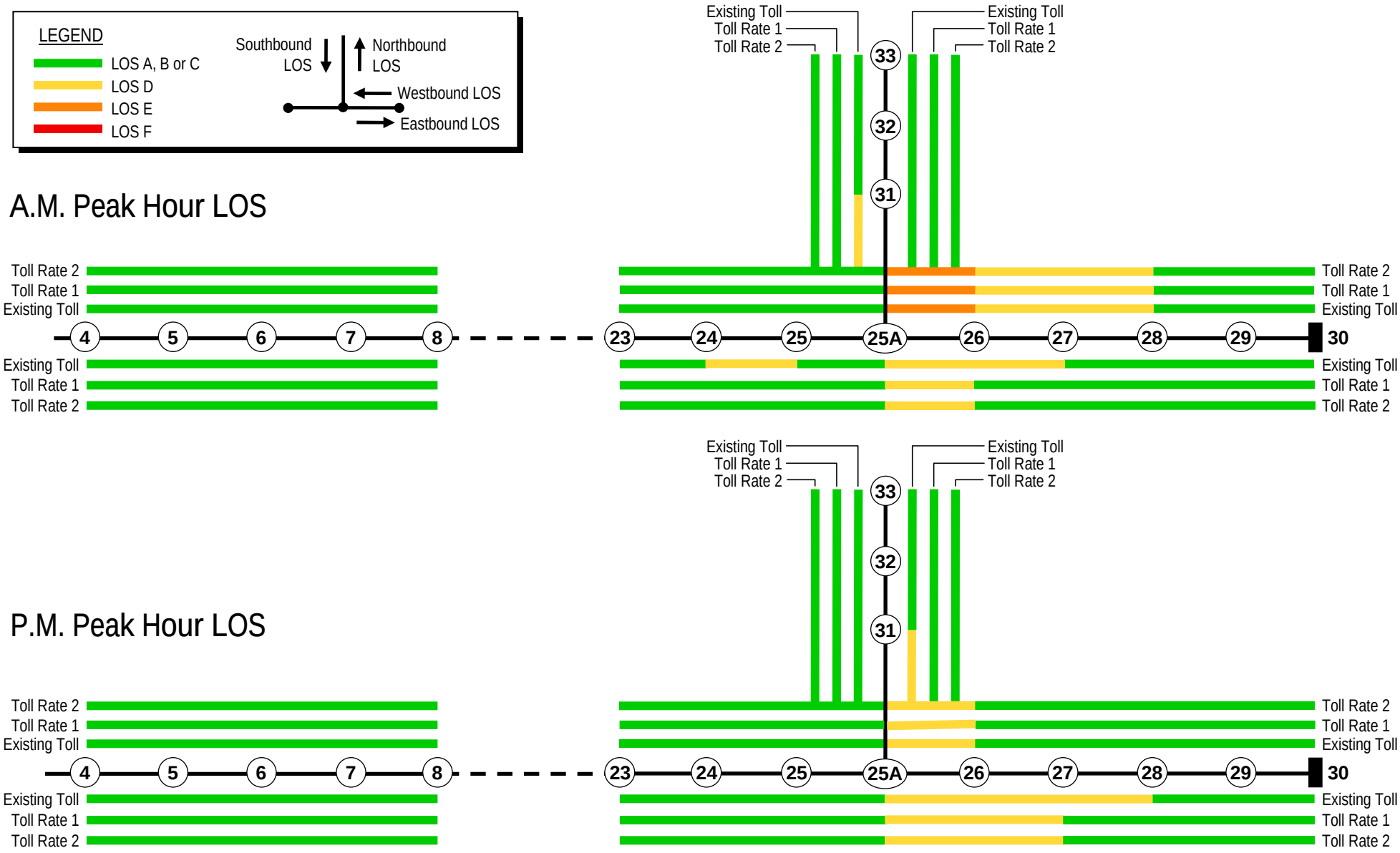
## ESTIMATED 2002 WEEKDAY PEAK HOUR LEVELS OF SERVICE
### SCENARIOS 9 and 17-9

FIGURE 6-13

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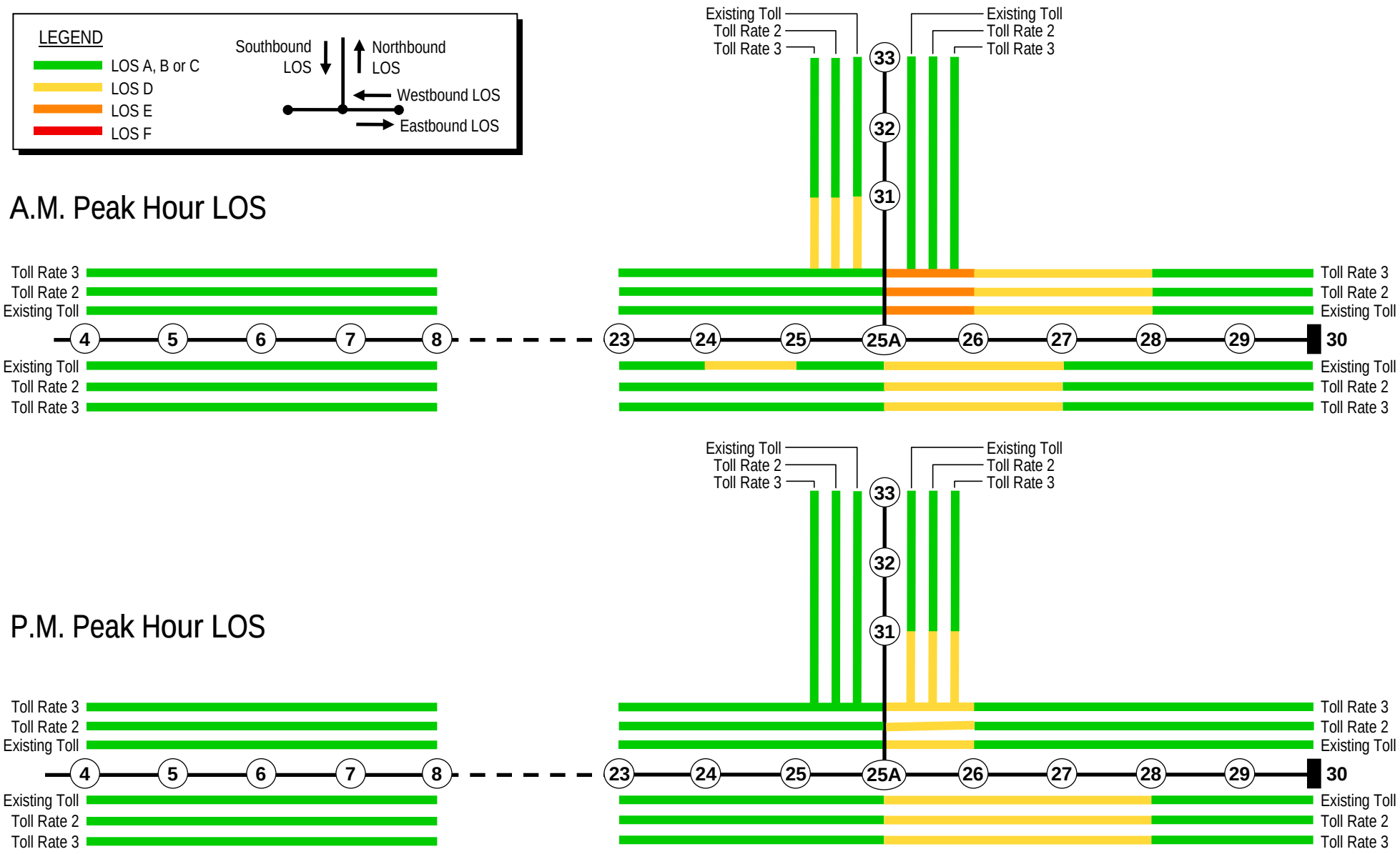
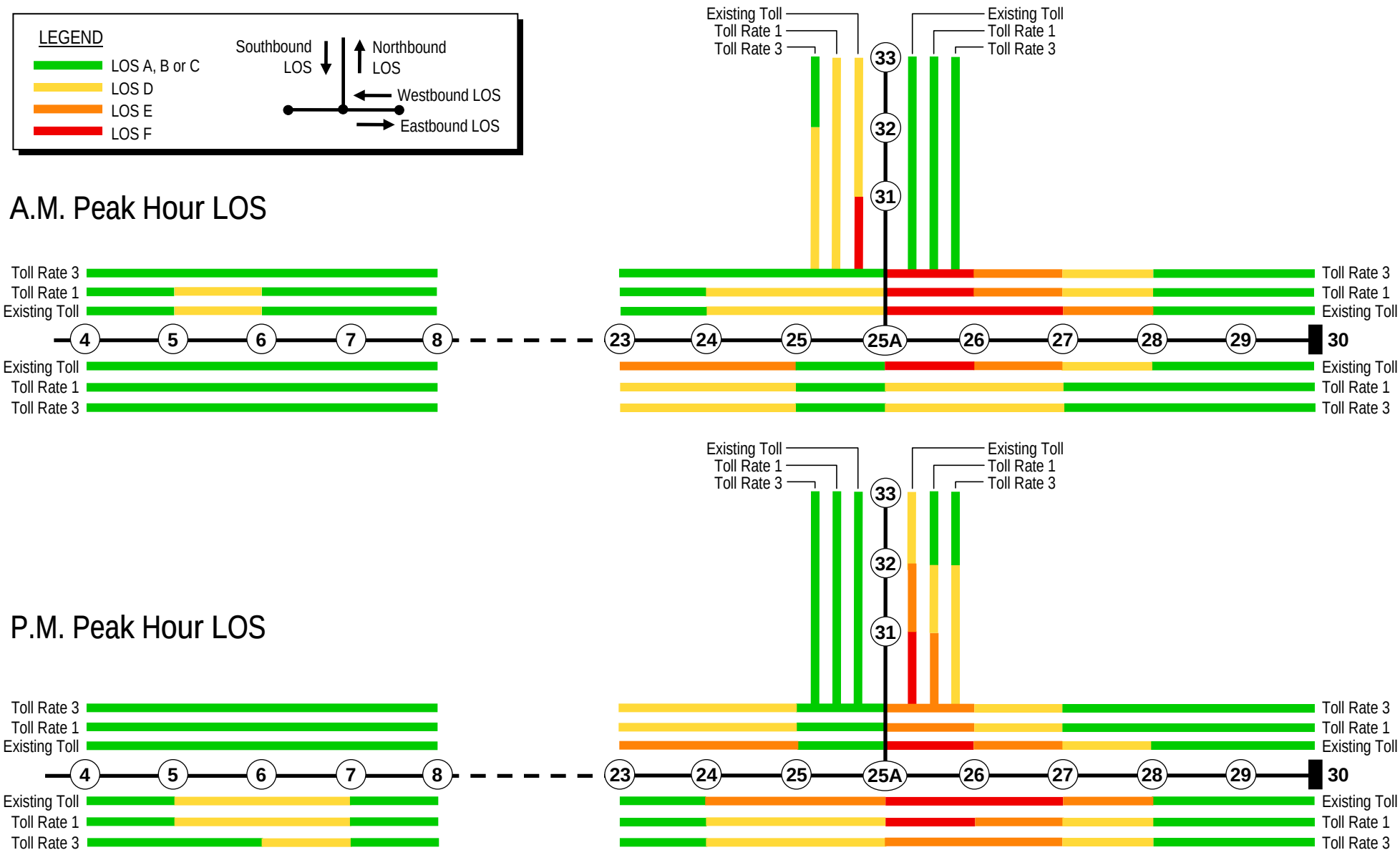
## ESTIMATED 2002 WEEKDAY PEAK HOUR LEVELS OF SERVICE
### SCENARIO 15

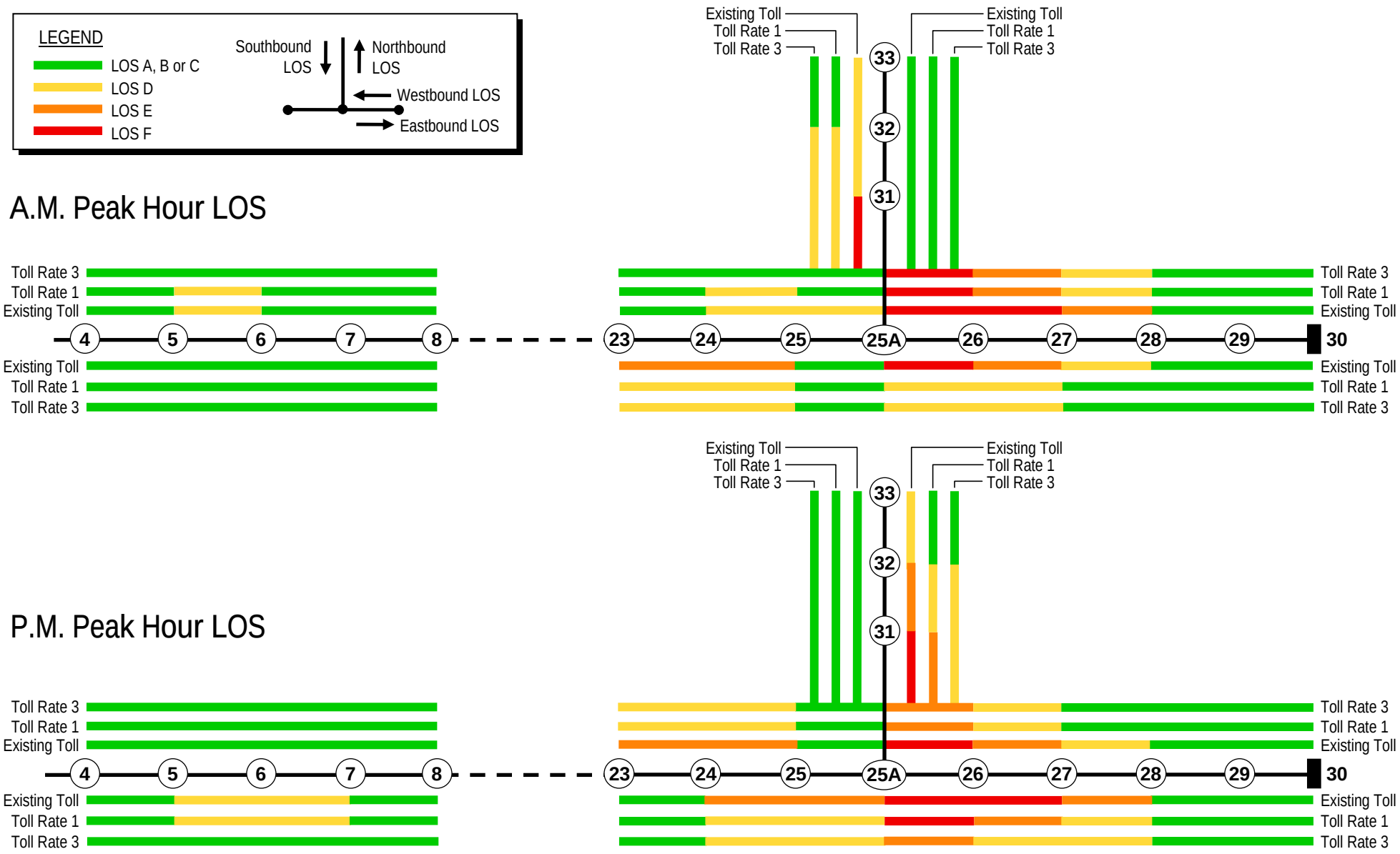
FIGURE 6-14

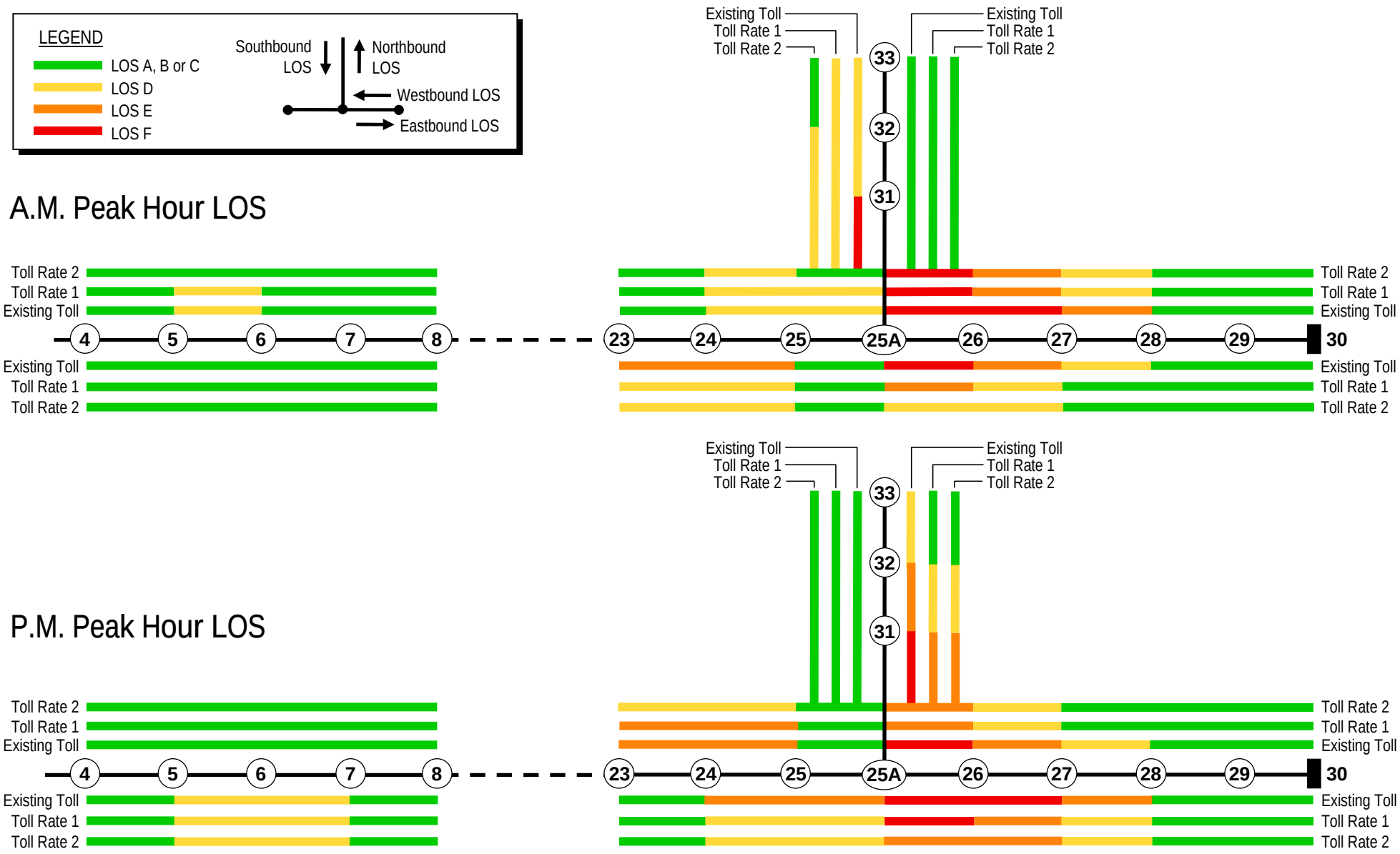



## ESTIMATED 2002 WEEKDAY PEAK HOUR LEVELS OF SERVICE
## SCENARIO 20

FIGURE 6-15


LEGEND
LOS A, B or C
LOS D
LOS E
LOS F
Southbound LOS
Northbound LOS
Westbound LOS
Eastbound LOS
A.M. Peak Hour LOS
Existing Toll
Toll Rate 1
Toll Rate 3
33
32
31
4
5
6
7
8
23
24
25
25A
26
27
28
29
30
P.M. Peak Hour LOS


LEGEND
LOS A, B or C
LOS D
LOS E
LOS F
Southbound LOS
Northbound LOS
Westbound LOS
Eastbound LOS
A.M. Peak Hour LOS
Existing Toll
Toll Rate 1
Toll Rate 3
33
32
31
4
5
6
7
8
23
24
25
25A
26
27
28
29
30
P.M. Peak Hour LOS

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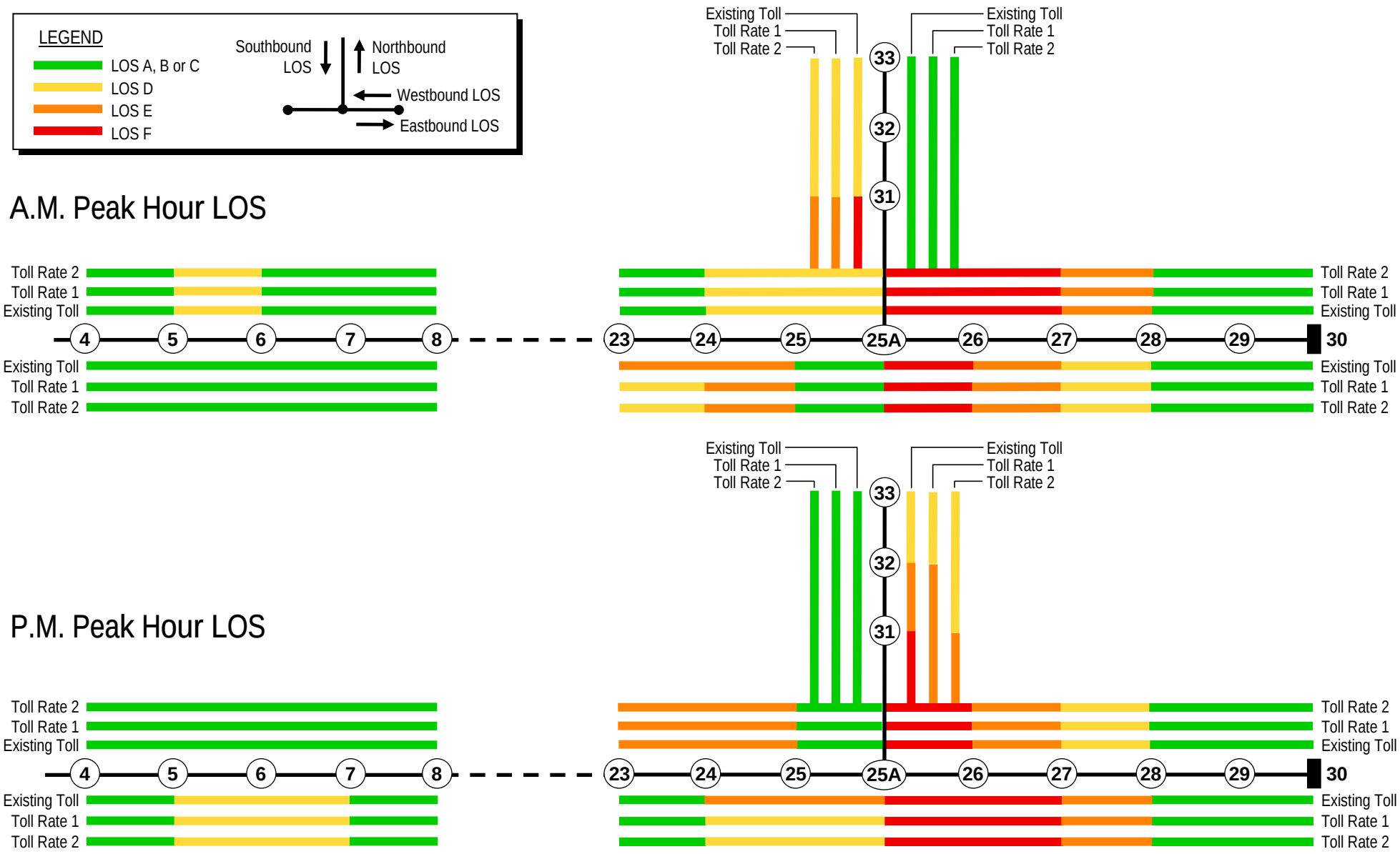
## ESTIMATED 2012 WEEKDAY PEAK HOUR LEVELS OF SERVICE
### SCENARIOS 9 and 17-9

FIGURE 6-18

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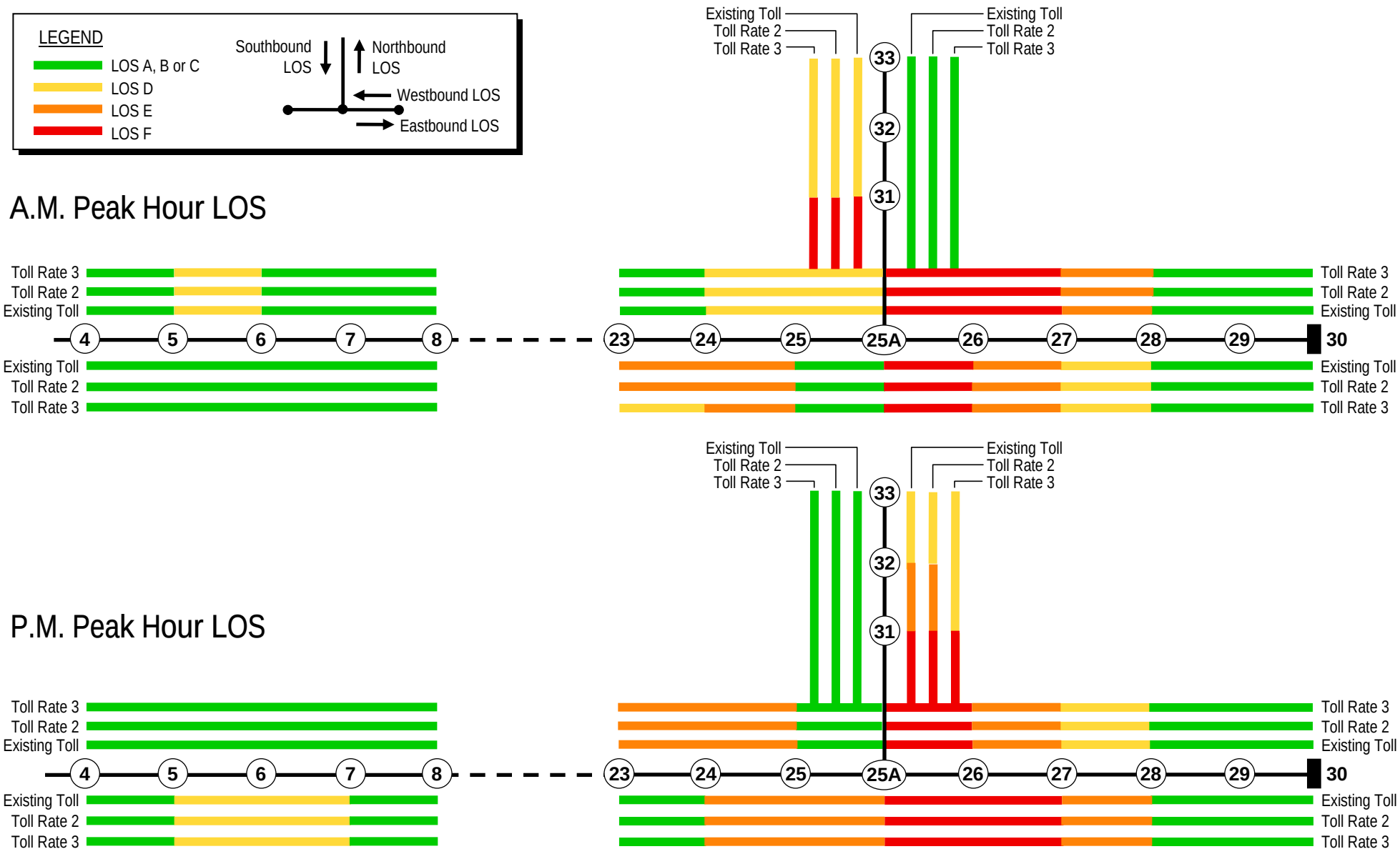
## ESTIMATED 2012 WEEKDAY PEAK HOUR LEVELS OF SERVICE
## SCENARIO 15

FIGURE 6-19

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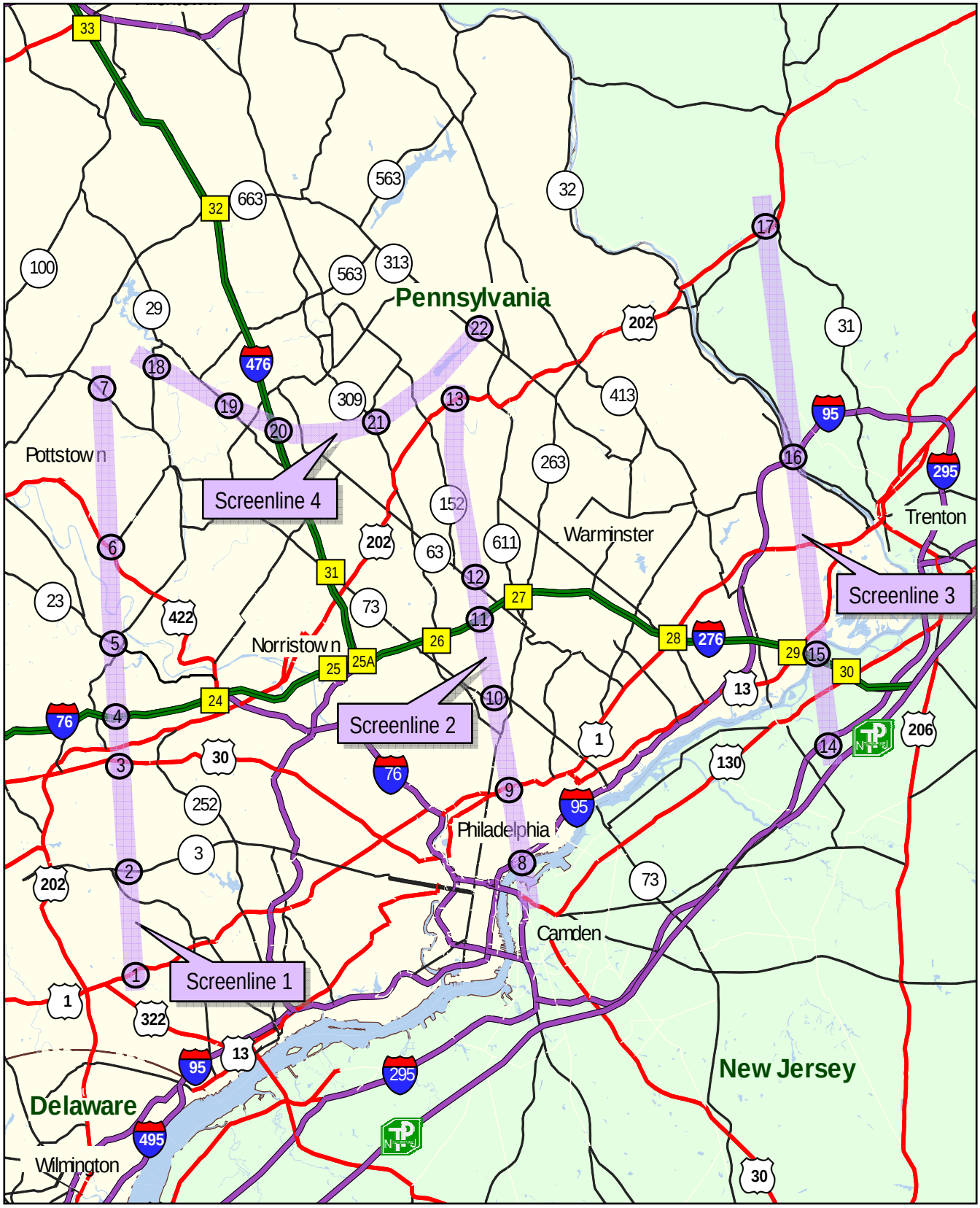
## ESTIMATED 2012 WEEKDAY PEAK HOUR LEVELS OF SERVICE
## SCENARIO 20

FIGURE 6-20

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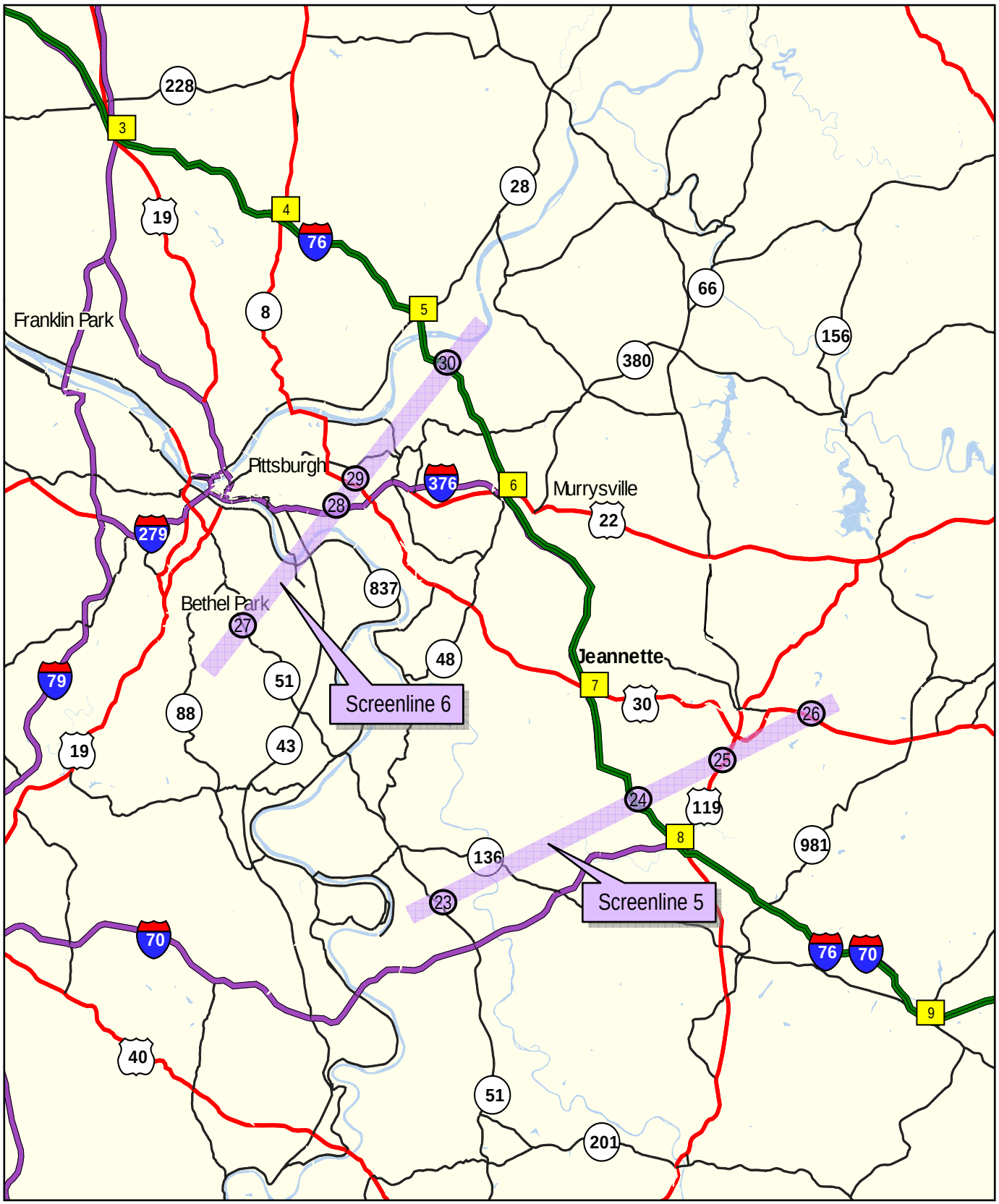
VALUE PRICING DIVERSION IMPACT SCREENLINES
PHILADELPHIA AREA

FIGURE 6-21

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VALUE PRICING DIVERSION IMPACT SCREENLINES
PITTSBURGH AREA

FIGURE 6-22

# CHAPTER 7

# ESTIMATED IMPACTS OF COMMERCIAL VEHICLE NIGHT TIME DISCOUNT SCENARIOS

An important consideration in the application of value pricing is its use specifically for commercial vehicles. To the extent that peak period commercial vehicle usage on the Turnpike can be shifted to off-peak periods, improvements in capacity and traffic flow during peak periods will be improved.

PTC requested that, in addition to the previous value pricing scenarios discussed in Chapters 4, 5, and 6 (which included both passenger car and commercial value pricing options) WSA study the concept of a night time only discount value pricing concept that would be applicable to commercial vehicles. WSA developed a separate, detailed, letter report on this topic and it is included in its entirety in the Appendix to this report.

## COMMERCIAL VEHICLE STATED PREFERENCE SURVEY BACKGROUND INFORMATION

As indicated in Chapter 2, commercial vehicle stated preference surveys were conducted with 25 trucking firms whose fleet regularly uses the Pennsylvania Turnpike. About 40 percent of these were small firms with less than 200 vehicles in their fleet; approximately 45 percent were mid-sized firms with 201 to 1000 vehicles; and the remaining 15 percent were firms with more than 1000 vehicles in their fleet.

Two interesting responses help to understand the willingness and ability of commercial vehicles to take advantage of value pricing. The first:

"Who decides the delivery route?"
- The Driver – 35 percent
- The Company – 60 percent
- Both – 5 percent

This would indicate that the company itself is the single most important variable in the ability to set a policy for taking advantage of the delivery route. The individual driver, however, does play a significant role in 35 percent of the companies when it comes to that decision making power.

The second key question was the following:

"What types of cargo does your company usually transport?"
Freight is time sensitive – 52 percent
Freight is both time and non-time sensitive – 32 percent
Freight is not time sensitive – 16 percent

This would indicate that in over half of the freight shipments, i.e., those that are time sensitive, toll rate incentives to shift travel time would not be effective. Still, that does mean that a significant proportion of companies would be able to shift travel time if the right incentives were provided.

## ESTIMATED NIGHT TIME DISCOUNT IMPACTS

PTC requested that WSA estimate the potential impacts of commercial vehicle night time discounts under a series of alternative scenarios. The following scenarios were tested:

**Applied to Classes 2-9 and:**

- Assuming a discount period between 11 PM and 5 AM

1. Impacts from a 10 percent E-ZPass toll discount,
2. Impacts from a 15 percent E-ZPass toll discount, and
3. Impacts from a 20 percent E-ZPass toll discount.

- Assuming a discount period between 10 PM and 5 AM

1. Impacts from a 10 percent E-ZPass toll discount,
2. Impacts from a 15 percent E-ZPass toll discount, and
3. Impacts from a 20 percent E-ZPass toll discount.

- Assuming a discount period between 9 PM and 5 AM

1. Impacts from a 10 percent E-ZPass toll discount,
2. Impacts from a 15 percent E-ZPass toll discount, and
3. Impacts from a 20 percent E-ZPass toll discount.

A final set of impacts was then assessed for the following two scenarios:

**Applied to Classes 4-9 and:**

- Assuming a discount period between 11 PM and 5 AM

1. Impacts from a 10 percent E-ZPass toll discount, and
2. Impacts from a 15 percent E-ZPass toll discount.

All commercial discounts in this analysis were restricted to E-ZPass patrons only. Commercial E-ZPass market share was assumed to be 65 percent at FY 2006 levels. Commercial vehicle cash transactions would not be eligible for the night time discounts. Traffic and revenue impacts were provided assuming the night time discount were offered on both weekdays only, and for all days of the week.

Under all scenarios tested, the net revenue loss to the Turnpike resulting from each of these was minimal. Even under the most liberal discount scenario identified above (a 20 percent discount offered between 9 PM and 5 AM and applicable all days of the week), the estimated net revenue loss only amounts to about 1 percent of total system toll revenue. The lowest percent revenue impacts amount to about a 0.3 percent loss of net toll revenue.

The net impact on commercial traffic volumes in the identified night time periods ranged from an increase of about 0.2 percent to about 0.7 percent as a result of the night time discount. It was estimated that all of the increase would occur from the shoulder hours that immediately precede and succeed discount period. In other words, if the discount period extended from 11 PM to 5 AM, the shift into the night time period would only occur from those traveling in the hours just preceding 11 PM, and the hours just after 5 AM. The ability to shift beyond these times was found to be very minimal.

# CHAPTER 8

# PA ROUTE 41 AND MOTORCYCLE E-ZPASS DISCOUNT ANALYSES

Two special studies, somewhat apart from value pricing, were conducted as part of the overall study. These are identified in previous locations, and are identified as Scenarios 18 and 19 in Tables 4-1, 4-4, and 6-1. This chapter will review the findings of each of these analyses.

A letter report was developed summarizing all work conducted on the PA Route 41 analysis. This letter is included, in its entirety, in the Appendix to this report.

## PA ROUTE 41 TRUCK IMPACT ANALYSIS

WSA was asked by PTC to evaluate the potential of shifting existing truck traffic from PA Route 41 in Chester County, PA to the Pennsylvania Turnpike. WSA's task was to analyze the potential impacts of reducing truck toll rates for Turnpike movements between Interchanges 19/247 (Harrisburg East) and 23/312 (Downingtown). To be eligible for a decreased toll, a truck would have to use both Interchange 19/247 and 23/312. A toll reduction would not occur, for example, if the truck entered Interchange 23/312 and exited Interchange 17/236.

It is our understanding that the impetus behind this analysis is the relatively high truck volumes currently traveling on PA Route 41. Apart from this study, local groups have also commissioned WSA to analyze a variety of alternative measures to reduce the negative impacts associated with these high levels of truck traffic. This study, however, only deals with the option of reduced Turnpike toll rates as a means to attract truck drivers to the alternative Turnpike routing. As such, not only will this study develop estimates of the potential traffic shifts from the existing PA Rt. 41 corridor, but it will also identify the estimated toll revenue impacts associated with reduced Turnpike toll rates.

No action was taken on the part of the Turnpike, at least for the reduced toll options between Harrisburg East and Downingtown for two primary reasons. First, WSA's analysis showed that the additional time and distance truckers would have to expend to use the Turnpike option would actually cost them nearly $20 more than their current Route 41 trip. Thus, even after offering toll rate reductions of up to 50 percent on the Turnpike for this movement, less than 50 trucks per day were estimated to shift from their current routing.

Secondly, the primary impact on the Turnpike was shown to be the loss of toll revenue for all the existing trips that currently make the trip between Harrisburg East and Downingtown. They too, would be eligible for any discounts offered to truckers shifting from PA Route 41. The net toll revenue impact was estimated to be a loss of nearly $160,000 at 2003 levels.

The combination of little impact on existing PA Route 41 travel patterns and revenue losses to the Turnpike make this an unlikely scenario to alleviate the congestion problems along PA Route 41. Other measures, such as widening the road, constructing bypasses, etc., would likely provide a much more direct solution to the problem.

## MOTORCYCLE E-ZPASS DISCOUNT ANALYSIS

Traditionally motorcycles have been classified as Class 1 vehicles on the Turnpike and paid the same toll as passenger cars. Many viewed this as inequitable and asked PTC to review this policy. WSA was asked to estimate the toll revenue impacts of providing discounts ranging from 15 to 50 percent for E-ZPass motorcycle patrons.

Table 8-1 provides a summary of the toll sensitivity analysis conducted, and includes tested discount rates of 15, 25, and 50 percent. The bottom portion of this table identifies the net impact on both cash and E-ZPass motorcycle usage. The decrease in the cash component reflects the shift from the cash category to E-ZPass as a result of the discounts being offered. The E-ZPass category, however, is shown to increase by an even bigger margin; this is due to the attraction of new motorcycle trips to the Turnpike as a result of the toll reduction.

As shown in Table 8-1, the net annual toll revenue loss amounts to between $6,000 at the 15 percent discount level and $22,000 at the 50 percent discount level. Table 8-2 presents the estimated annual impacts through 2013. As shown, revenue losses are miniscule compared to total

system toll revenues. In fact, even at the 50 percent discount level, the revenue loss amounts to less that 0.1 percent of total Turnpike revenue.

Based on this analysis, a motorcycle E-ZPass rate reduction of 25 percent was implemented on July 1, 2003. Based on reports from PTC the impact on toll revenue has been minimal.

**Table 8-1**

## Summary of Estimated FY 2002 Level Traffic and Toll Revenue Impacts of Discounted ETC Motorcycle Trips

Pennsylvania Turnpike Value Pricing Study

| % ETC Discount (1) | Estimated Annual Motorcycle Toll Transactions | | | Estimated Annual Motorcycle Toll Revenue | | |
|---|---|---|---|---|---|---|
| | Cash (3) | ETC (3) | Total | Cash (3) | ETC (3) | Total |
| 0 (2) | 32,198 | 32,198 | 64,396 | $49,721 | $49,721 | $99,441 |
| 15 | 31,329 | 33,744 | 65,072 | 48,378 | 44,910 | 93,288 |
| 25 | 30,717 | 34,806 | 65,523 | 47,433 | 41,500 | 88,933 |
| 50 | 29,043 | 37,511 | 66,553 | 44,848 | 32,345 | 77,193 |

| % ETC Discount (1) | Estimated Annual Toll Transaction Impacts | | | Estimated Annual Toll Revenue Impacts | | |
|---|---|---|---|---|---|---|
| | Cash (3) | ETC (3) | Total | Cash (3) | ETC (3) | Total |
| 0 (2) | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | (869) | 1,546 | 676 | ($1,342) | ($4,810) | ($6,153) |
| 25 | (1,481) | 2,608 | 1,127 | (2,287) | (8,221) | (10,508) |
| 50 | (3,155) | 5,313 | 2,157 | (4,873) | (17,375) | (22,248) |

(1) The discounts shown only apply to motorcycle trips using ETC. The only exception to these discounts is that a minimum $0.50 toll is assumed for all vehicles, including motorcycles using ETC. No toll change is assumed for cash motorcycle trips.

(2) The "0 Percent" motorcyle volumes are based on counts provided by PTC, and which show about 55,000 total annual motorcyle trips on the ticket system in 1997. An annual growth rate of about 3.2 percent was applied to develop the 2002 volumes.

(3) For purposes of this analysis, it was assumed that there is a 50/50 split between cash and ETC motorcycle toll transactions.

**Table 8-2**

## Summary of Estimated Impact of Motorcycle ETC Discounts on Annual Toll Revenue

Pennsylvania Turnpike Value Pricing Study

In Thousands

| Fiscal Year | Estimated Toll Revenue (1) | Estimated Impact From Motorcycle ETC Discounts (2) | | | Estimated Base Case Toll Revenue After Motorcycle ETC Discounts | | |
|---|---|---|---|---|---|---|---|
| | | 15 % | 25 % | 50 % | 15 % | 25 % | 50 % |
| 2002 | $373,536 | ($6) | ($11) | ($22) | $373,530 | $373,525 | $373,514 |
| 2003 | 388,803 | (6) | (11) | (23) | 388,797 | 388,792 | 388,780 |
| 2004 | 403,632 | (6) | (12) | (24) | 403,626 | 403,620 | 403,608 |
| 2005 | 419,029 | (7) | (12) | (25) | 419,022 | 419,017 | 419,004 |
| 2006 | 432,655 | (7) | (13) | (25) | 432,648 | 432,642 | 432,630 |
| 2007 | 447,929 | (7) | (13) | (26) | 447,922 | 447,916 | 447,903 |
| 2008 | 464,320 | (7) | (14) | (27) | 464,313 | 464,306 | 464,293 |
| 2009 | 477,671 | (8) | (14) | (28) | 477,663 | 477,657 | 477,643 |
| 2010 | 489,667 | (8) | (14) | (29) | 489,659 | 489,653 | 489,638 |
| 2011 | 502,319 | (8) | (15) | (30) | 502,311 | 502,304 | 502,289 |
| 2012 | 515,444 | (8) | (15) | (30) | 515,436 | 515,429 | 515,414 |
| 2013 | 529,615 | (9) | (16) | (31) | 529,606 | 529,599 | 529,584 |

(1) These values represent total estimated net Turnpike toll revenue, including both ticket and barrier systems. No toll increases are assumed throughout the forecast period.

(2) These values are based on the toll revenue impacts identified in Table 1. The discounted toll rates shown only apply to ETC motorcycle trips. The only exception was the maintenance of a $0.50 minimum toll for all vehicles, regardless of the discount.